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Chapter Title: Where Does the Money Go?

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12 Where Does the Money Go?

The rising costs of higher education fall into different categories of expenditures. The U.S. Department of Education survey of higher education, HEGIS/IPEDS, uses 11 categories to describe the different activities constituting the core of colleges and universities.[1] The main function is instruction, followed by plant operations and student services. By comparing the survey accounts for 1978–79 with those for 1987–88, we can learn how rapidly costs increased in the different categories. Did all the categories of expenditures increase faster than the general price level? Yes. Did instructional expenditures increase faster or slower than average? Slower. Was the rate of increase in the several categories the same for different kinds of institutions? No. Was the pattern of change the same for comprehensive universities as for liberal arts colleges, for publics as for privates? No, and no. This type of evidence will not allow us to conclude that the institutions are either highly competitive and efficient or noncompetitive and inefficient. But knowing where the funds go will make clear what functions have had priority among college presidents and their boards over the last decade and how the institutions adapted to a changing environment. We may then be able to draw inferences about how the institutions respond to changes in their environments.

12.1 Education and General Expenditure

Current (as opposed to capital) expenditures on the core functions of a college or university are called educational and general (E&G) expenditures.

1. HEGIS/IPEDS purports to classify expenditures by function rather than by type of input (e.g., cost of goods sold, salaries, utilities, etc.). To complicate matters, it actually does some of both, aggregating all interest expenditures into a single category and all utility expenditures into a single category but allocating payroll and supplies across several categories on the basis of their purpose. The result is considerable discretion in the classification of expenditures by respondents.

They cover teaching, research, and public service. Four categories of expenditures beyond the E&G core complete the total annual spending by colleges and universities.

First, most capital expenditures are treated separately from E&G. Indeed, because few colleges or universities charge annual depreciation to their current accounts, annual E&G expenditures reflect little in the way of capital costs, either initial investment or the annual flow of services from buildings and equipment. In this sense, the annual flow of expenditures we analyze here understates costs and will understate costs relatively more at more capital intensive institutions. During a period of relatively stable aggregate enrollments, such as the 1980s, depreciation charges might be expected to remain fairly stable; thus, their exclusion may not undermine cost comparisons over time. On the other hand, some institutions invested substantial resources in repair and maintenance of facilities during the 1980s, while others have not (Rush and Johnson 1989).[2] Whether major repair expenditures show up in annual plant operations costs or are treated as capital costs is unknown to us and likely varies by institution.

Second, auxiliary enterprises, including housing, food service, bookstores, and intercollegiate athletics, are generally excluded from E&G expenditures.[3] Auxiliary enterprise expenditures are roughly 10 percent of current fund expenditures (which include all expenditures except capital investments). But auxiliary enterprises are undergoing substantial change on many campuses, as food services and bookstores, in particular, are increasingly contracted out to private for-profit companies.[4] In such cases, the college or university usually negotiates the return of a percentage of gross revenue for the use of its facilities and access to its student customers. Such an arrangement, of course, removes considerable gross expenditures and revenues from the books of colleges and universities, in the same way that notebook paper purchased at a private stationery store or a personal computer purchased through an electronics dealer never appears as part of college and university expenditures. To the

We rely on the first principle of accounting—consistency is more important than accuracy—to give us confidence that apparent changes in expenditures in certain categories over times are real changes rather than reflections of arbitrary shifts in the classification of expenditures.

2. A 1988 survey of physical facilities on American college campuses reported $60 billion of deferred maintenance, $20.5 billion of which was classified as in "urgent" need of repair (Rush and Johnson 1989). This amounts to more than $1,500 for every enrolled student. The problem is worst at Research and Doctoral institutions (see also Kaiser 1989). The run-down campuses of the 1970s and 1980s will require substantial attention in the coming decades, making the issue of how to account for capital improvements a more important matter in the future.

3. One of 12 institutions in a survey we use subsequently to disaggregate E&G expenditures includes intercollegiate athletics in its E&G accounts.

4. In a 1990 survey of 31 mostly Research and Doctoral universities, respondents reported that 67 percent of institutionally provided meals on their campuses were produced by a private for-profit contractor and that 17 percent of on-campus textbook sales were made by a private contractor leasing the bookstore (see Siegfried, Getz, and Dunn 1991, table 2). For a detailed discussion of the issues, see Bookman (1989).

extent that expenditures on food and housing would be incurred whether or not an individual is enrolled in college, their exclusion from the accounts may be a good thing, as they do not represent an opportunity cost. Some auxiliary services, however, such as textbook sales, clearly represent resources consumed *because* the consumers are enrolled in college. For the present, the situation is discomforting as the proportion of student expenditures for services provided by auxiliaries appearing in the financial records of colleges and universities is unknown.[5]

Third, hospitals, whether integral to the teaching missions of medical schools, as at Duke, or simply community service facilities, as at the University of the South, are excluded from E&G expenditures, being a special case of an auxiliary service. Hospitals, in aggregate, account for almost 10 percent of total current fund expenditures. Of course, a much greater share of expenditures goes to hospitals at the relatively few institutions with medical centers. Again, if university hospitals simply substitute for non-university hospital services, the expenditures are not additions attributable to higher education, and they do not reflect resources that would be conserved if colleges and universities did not exist. Surely, only a minuscule fraction of the patients at university hospitals are students who got sick or were injured because they were studying!

Finally, other independent operations, primarily federally funded research and development centers, are excluded from E&G expenditures. This category is very small compared to E&G.

E&G expenditure categories define a set of functions that are reasonably common and central to the educational missions of most colleges and universities. E&G represents roughly 80 percent of total current fund spending by colleges and universities (Anderson, Carter, and Malizio, 1989, table 99, p. 155) and accounts for most of the added expenditures that are incurred because students are enrolled in a college or university.

12.2 Adjusted Educational and General Expenditures

The 11 functional categories of E&G used by HEGIS/IPEDS encompass broad areas of the educational enterprise. Table 12.1 reports expenditures separately in eight of these categories as the share of adjusted educational and general (AE&G) expenditure. One E&G category, libraries, is included in a broader category, academic support. Two E&G categories, sponsored research and restricted scholarships, are excluded from AE&G and are not reported here. Table 12.2 reports the average expenditure per student in each functional category for 1978–79 and 1987–88 for all institutions combined and for four-year and Two-Year colleges separately.

5. To the extent that an institution leases access to it students and space on its campus to private suppliers of auxiliary services, some gross revenues (i.e., the lease payments) continue to show up in the accounting records.

Table 12.1 **Distribution of Adjusted Educational and General (AE&G) Expenditures, 1978–79 and 1987–88**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
All institutions (N = 2,045):									
1978–79	.491	.046	.102	.067	.127	.120	.026	.021	1.000
1987–88	.476	.046	.105	.073	.134	.108	.040	.018	1.000
Change	−.015	.000	+.003	+.006	+.007	−.012	+.014	−.003	.000
Four-year institutions (N = 1,192):									
1978–79	.486	.052	.106	.063	.122	.121	.030	.020	1.000
1987–88	.471	.051	.109	.067	.129	.107	.046	.019	1.000
Change	−.015	−.001	+.003	+.004	+.007	−.014	+.016	−.001	.000
Two-Year institutions (N = 853):									
1978–79	.515	.017	.079	.086	.151	.117	.005	.029	1.000
1987–88	.498	.023	.086	.103	.159	.117	.007	.009	1.000
Change	−.017	+.006	+.007	+.017	+.008	.000	+.002	−.020	.000

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

Table 12.2 **Adjusted Educational and General (AE&G) Expenditures per Full-Time-Equivalent Student in Constant 1987–88 Dollars,[a] 1978–79 and 1987–88**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[b]	Academic Support[c]	Student Services[d]	Institutional Support[e]	Plant Operations	Internal Scholarships[f]	Mandatory Transfers[g]	Total AE&G[h]
All institutions (N = 2,045):									
1978–79	3,126	294	647	427	809	767	164	136	6,370
1987–88	3,863	376	855	594	1,088	881	323	142	8,122
Change	+737	+82	+208	+167	+279	+114	+159	+6	+1,752
Share of increase	42.1	4.7	11.9	9.5	15.9	6.5	9.1	.3	100.0
Share of AE&G expenditures, 1987–88	47.6	4.6	10.5	7.3	13.4	10.8	4.0	1.8	100.0
Four-year institutions (N = 1,192):									
1978–79	3,539	379	772	460	890	881	217	144	7,282
1987–88	4,432	478	1,025	633	1,215	1,006	432	180	9,401
Change	+893	+99	+253	+173	+325	+125	+215	+36	+2,119
Share of increase	42.1	4.7	11.9	8.2	15.3	5.9	10.1	1.7	100.0
Share of AE&G expenditures, 1987–88	47.1	5.1	10.9	6.7	12.9	10.7	4.6	1.9	100.0
Two-year institutions (N = 853):									
1978–79	2,026	68	312	340	593	462	21	114	3,936
1987–88	2,362	108	407	489	753	554	35	41	4,749
Change	+336	+40	+95	+149	+160	+92	+14	−73	+813
Share of increase	41.3	4.9	11.7	18.4	19.7	11.3	1.7	−9.0	100.0
Share of AE&G expenditures, 1987–88	49.8	2.3	8.6	10.3	15.9	11.7	.7	.9	100.0

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Current dollars are converted to constant dollars with the GNP implicit price deflator in this and all subsequent tables.

[b]Includes extension service.

[c]Computers, libraries, and deans.

[d]Admissions, registrars, counseling, student health, and recreation.

[e]Administration, accounting, security, alumni, and development.

[f]Scholarships from internal funds.

[g]Debt service.

[h]Total AE&G expenditures under control of chief executive officer.

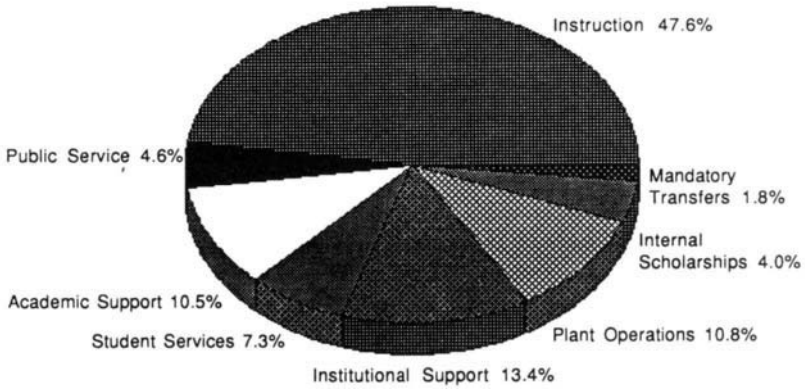

Figure 12.1 Allocation of AE&G Expenditures, 1987–88.
Source: Table 12.1.

The AE&G figures exclude externally funded research (e.g., National Science Foundation grants) and restricted (and mostly externally funded) scholarships (e.g., Pell grants). We exclude these two categories from our base total because each category contains largely earmarked funds, that is, funds not subject to the discretion of the institution's management. Our primary concern in this part of the volume is with resource allocation decisions made by colleges and universities, and these two categories are largely beyond that purview.

Libraries are reported separately in HEGIS/IPEDS but are also included with academic support expenditures. We do not report them separately. Therefore, there are actually eight categories across which AE&G expenditure patterns can vary in this study. These are described in detail below. A recent study of most of these categories (Cambridge Associates 1990) for 12 private research universities improves our understanding of what constitutes each. Figure 12.1 depicts the allocation of AE&G among the eight categories in 1987–88.

12.2.1 Instruction

Instruction accounts for nearly half of AE&G expenditures (see Table 12.1). Instruction includes salaries and fringe benefits for faculty and support staff, both full-time and part-time, and materials and supplies for general academic instruction, including faculty travel, communications, and personal computers. Expenditures for all types of instruction (occupational and vocational, community education, adult basic education, remedial, and tutorial) are included. This category also includes expenditures for public services that are not separately budgeted and all "departmental research," which is the cost

of research not supported externally.[6] This departmental research is the part-time research that many faculty do routinely as part of their work. Much of it is an essential ingredient of teaching excellence. Thus, a great deal of research activity of colleges and universities, as well as some public service expenditures, is lumped together with direct instructional expenditures in this category. The relative importance of research in the instruction expenditures category will undoubtedly vary by type, control, and size of institution. James (1978) used a faculty questionnaire to estimate the importance of teaching within the instructional budget at research universities. She found it was slightly less than 50 percent in the mid-1970s and had declined from about 70 percent in the early 1960s.[7] Continued change in this fraction complicates the interpretation of cost changes. Although real instructional expenditures per student continued to rise during the 1980s, instruction's share of AE&G expenditures declined by about 1.5 percentage points, as shown in table 12.1. Teaching's share of instruction may have also declined over the period if the trend detected by James has not been reversed.

12.2.2 Public Service

Public service accounts for about 5 percent of AE&G in four-year institutions and about 2 percent in Two-Year colleges. It accounts for about 11 percent of AE&G at public Research universities and about 5 percent at public Doctoral universities but no more than 3 percent in any category of private institutions or in the remaining categories of public colleges and universities. Public service includes funds expended for activities established primarily to provide noninstructional services beneficial to groups external to the institution. Agricultural experimentation stations and extension services are an obvious example. At a sample of seven public Research universities that we surveyed by telephone, agricultural experimentation and extension services accounted for 62 percent of the public service category; continuing education was the second most important type of public service expenditure at these institutions, accounting for 5 percent of the category.[8] Some medical center expenditures may account for a significant portion of public service expenditures (e.g., unreimbursed hospital services or overhead expenses for public

6. Over time, improvements in college and university accounting systems will probably reduce instruction costs because instruction is the category used to collect residual expenditures—those expenditures that are not specifically identified and assigned to their most appropriate account. The importance of this bias in the trends of category shares depends on the rate at which accounting systems in higher education are refined.

7. If half the instruction budget is devoted to university-supported research, America's 98 Research universities alone (excluding the many Doctoral, Comprehensive, and Liberal Arts I institutions that engage actively in research) spent $5.9 billion on research in 1987–88. This is over 10 percent of the total federal expenditure on research and development (see Chapter 11, n. 24).

8. The public Research universities we queried about the composition of their 1987–88 public service expenditures were the Universities of Arkansas, Florida, Georgia, Kentucky, and North Carolina, Clemson University, and Michigan State University.

medical clinics). Public policy institutes, conference programs, science fairs, and cultural programs are also usually included in this category. Public service expenditures at Two-Year colleges seem to be primarily for cooperative (with government) job retraining programs under the Job Training Partnership Act.[9] Public service expenditures grew at the same rate as aggregate AE&G from 1978–79 to 1987–88.

12.2.3 Academic Support

Academic support accounts for about 10 percent of AE&G. Academic support includes expenditures for libraries, museums, galleries, audiovisual services, academic computing support, academic administration, personnel development, and course and curriculum development. For the 12 private research universities in the Cambridge Associates study, 93 percent of academic support is allocated to libraries (40 percent),[10] academic computing (10 percent), and administration (43 percent). Academic support expenditures grew at the same rate as aggregate AE&G from 1978–79 to 1987–88.

12.2.4 Student Services

Student services account for about 7 percent of AE&G at four-year institutions and slightly over 10 percent at Two-Year colleges. Student services include expenditures for admissions, registrar activities, and activities whose primary purpose is to contribute to students' emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program. It includes career guidance and placement, counseling, financial aid administration, and student health services. It also includes the administrative allowance for Pell grants. For the 12 institutions in the Cambridge Associates study, this category consists primarily of admissions (22 percent), vice president for campus life (13 percent), student health services (9 percent), registrar (9 percent), student activities (8 percent), financial aid administration (8 percent), intramural sports (4 percent), counseling (3 percent), and student union (3 percent). The remaining 20 percent of student services goes to such diverse activities as band, college chaplain, fraternity/sorority assistance, and learning support services. Student services expenditures are growing faster than other expenditures at all types of institutions, but they are particularly high and increasing rapidly at private liberal arts colleges.

9. The public Two-Year colleges we queried about the composition of their 1987–88 public service expenditures were Jackson State and Columbia State Community Colleges.

10. Reliable HEGIS/IPEDS data on libraries are available for 1978–79. The percentage of academic support accounted for libraries in Research, Doctoral, Comprehensive, Liberal Arts I, Other-Four-Year, and Two-Year colleges is 41, 48, 46, 59, 52, and 43, respectively. For the 12 private research universities in the Cambridge Associates study, 54 percent of library expenditures was for salaries, and 33 percent was for the acquisition of books and serials.

12.2.5 Institutional Support

Institutional support accounts for about 13 percent of AE&G, but much more in Two-Year colleges and four-year liberal arts colleges (where it is close to 20 percent), and noticeably less in Research universities (where it is about 10 percent). Institutional support includes expenditures for general administrative services, executive direction and planning, legal and fiscal operations, accounting, public relations, alumni and development, and, often, police and security. For the 12 private research universities in the Cambridge Associates study, the majority of institutional support was for administration and finance: the office of the president and provost accounted for 13 percent, and other administrative and finance offices accounted for 40 percent (personnel, legal affairs, affirmative action, vice president finance, controller, budget, internal audit, purchasing, treasurer). The offices of governmental relations, public relations, and alumni and development averaged 25 percent of the total. The remaining important components of institutional support include administrative computing (6 percent), academic support other than the provost (e.g., dean of graduate school, facilities planning, emeriti center, sponsored research administration; 6 percent), police and security (3 percent), and other miscellaneous, which includes such items as telecommunications, mail service, bus service, printing, risk management, and child-care center (6 percent). The share of expenditures going to institutional support is growing at all types of institutions, but it is rising most rapidly at Doctoral and Comprehensive universities.

12.2.6 Operation and Maintenance of Plant

Plant operations expenditures account for about 11 percent of AE&G. Plant operations includes expenditures for operations established to provide service and maintenance related to grounds and facilities. It includes utilities, fire protection, housekeeping, grounds maintenance, carpentry, electrical, plumbing, heating and ventilating repair, and property insurance premiums. Plant and grounds maintenance is the largest component of plant operations, accounting for 38 percent in the Cambridge Associates study. Utilities is the next largest component at 34 percent, followed by housekeeping and janitorial expenses (11 percent), plant administration (5 percent), and fire, security, and safety (4 percent). Thus, about half of plant operations costs are devoted to the purchase of services in local labor markets, while about one-third goes to purchase energy.[11] Campus security expenditures are often included in plant operations if they are not part of institutional support. Plant operations expenditures increased more slowly than overall AE&G expenditures at all types

11. The Association of Physical Plant Administrators periodically collects data from member institutions about their plant operations expenditures. Based on their sample of 520 institutions for 1987–88, we can subdivide the plant operations category and report the percentage distribution of expenses across subcategories by Carnegie classification:

of institutions during the 1980s, at least in part as a result of only modest increases in the cost of utilities over the period.

12.2.7 Unrestricted Scholarships

Unrestricted scholarships now account for about 4 percent of AE&G. Unrestricted scholarships include grants and stipends paid to individuals enrolled in formal course work and tuition and fee remissions. Unrestricted scholarships are scholarships for which no stipulation has been made by an external agency or donor as to the disposition of funds; these are funds that are allocated to scholarships at the discretion of the institution. Scholarship aid is, in effect, a price discount offered to selected students, often those who could not otherwise afford the college they attend or those with unusual academic or athletic talent. It can be argued that scholarship aid is not an expenditure but rather a reduction in revenues. On the other hand, concern about the level of tuition has largely focused on tuition before taking account of scholarship grants, on the "sticker price." The many students receiving no scholarship assistance view the list price tuition as the relevant base. To the extent that their tuition rises to produce revenue to fund scholarships, these students and their families would view unrestricted scholarships as a "cost." This cost may provide nonscholarship students with a richer peer environment and, thus, augment their college experience. In such a context, it makes sense to view scholarships as an expenditure. Furthermore, the scholarship budget competes, to a degree, with other expenditure categories for resources. Therefore, we elected to treat it as an expenditure category in spite of its fundamental ambiguous nature. Unrestricted scholarships, although a relatively small proportion of total AE&G, is the single fastest-growing category of expenditures in higher education. Growth has been fastest at Liberal Arts I and Other-Four-Year colleges.

12.2.8 Mandatory Transfers

The mandatory transfers category includes expenditures that must be made in order to fulfill binding legal obligations. It is primarily interest expense on debt.

Carnegie Classification	Sample Size	Administration & Engineering	Building Maintenance	Custodial	Grounds Maintenance	Utilities
Research	87	7.2	23.4	20.6	5.5	43.3
Doctoral	35	6.9	22.1	25.3	6.0	39.6
Comprehensive	69	7.8	21.8	25.6	7.3	37.5
Liberal Arts[a]	61	9.8	26.8	24.4	8.6	30.4
Two-Year	158	12.9	25.7	22.9	7.2	31.2
Totals	410[b]	10.0	24.5	23.1	6.9	35.5

Source: Association of Physical Plant Administrators (1989, table 3).
[a]Liberal Arts = Liberal Arts I plus Liberal Arts II.
[b]Specialized and professional institutions are not reported.

12.3 Other Current Account Expenditures

Three categories of E&G expenditures in HEGIS/IPEDS are excluded from our AE&G expenditures. They are sponsored research, restricted scholarships, and libraries. Library expenditures are included in academic support, described above.

12.3.1 Sponsored Research

Externally supported research is very important at Research universities, modestly significant at Doctoral institutions, and relatively insignificant at other types of colleges and universities. Expenditures for sponsored research are equal to about 30 percent of AE&G at Research universities,[12] although they are not part of AE&G as we have figured it. Sponsored research includes expenditures for research commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the institution. It is primarily research supported by noninstitutional funds. Externally funded research has been growing faster than AE&G expenditures at Research universities, about kept pace at Doctoral institutions, and is lagging behind the growth in overall AE&G in all other types of institutions. The result is an increase in the concentration of sponsored research at Research institutions.

12.3.2 Restricted Scholarships

Restricted scholarships account for 6.6 percent of AE&G.[13] Restricted scholarships include grants paid to individuals enrolled in formal course work where the source of funds is an external agency or donor who has stipulated the precise use of the funds. The institution has no discretion in their use. Federal Pell grants are the largest component of restricted scholarships. Need-based and merit-based scholarships are commingled in this account.

Both externally sponsored research and restricted scholarships are, in a sense, "flow-through" expenditures. They are administered by colleges and universities but funded externally. In both cases, the income is expected to match the expenditures for such purposes, and such funds may not be diverted to alternative uses. This approach, in the case of externally funded research, presumes that indirect costs realistically represent actual (long-run incremental) costs incurred by the institution in the performance of sponsored research (Massy 1990).[14] In the case of restricted scholarships, this approach presumes

12. At Doctoral, Comprehensive, Liberal Arts I, Other-Four-Year, and Two-Year colleges in 1987–88, sponsored research accounted for 9.9, 2.4, 1.4, 0.6, and 0.0 percent of AE&G respectively.

13. Restricted scholarships as a percentage of AE&G expenditures varied by Carnegie group as follows: Research 5.6, Doctoral 5.9, Comprehensive 8.0, Liberal Arts I 7.9,Other-Four-Year 13.9, and Two-Year Colleges, 8.2. The value of need-based scholarship aid depends, in part, on the tuition level of the institution a student attends. Thus, relatively high-priced colleges and universities with need-blind admissions will enroll students who are eligible for large restricted scholarships, especially federal Pell grants.

14. Considerable controversy exists about whether the indirect costs of sponsored research

that the costs of administering the scholarships are covered separately by the external agency, which is the way that Pell grants are organized if the administrative allowance for Pell grants accurately represents the added cost of handling them. It also presumes that an institution's expenditures are not affected, in general, by financial aid programs.[15]

For some purposes, it is also desirable to exclude *unrestricted* scholarships from E&G expenses. Unrestricted scholarships are a return of tuition money to students, albeit after a redistribution. In order to gauge the rise in the real cost of higher education accurately, we periodically report on AE&G expenditures *less* unrestricted scholarships, which is a rough measure of the value of the resources consumed directly in the production of higher education services. It would be roughly equivalent to long-run opportunity costs if factors of production were all hired in competitive markets (Hoenack 1990)[16] and capital costs were included.

12.4 Cost Trends among Functional Categories

Most of the analysis that follows compares expenditures for separate expenditure categories to AE&G expenditures. The adjusted figure excludes sponsored research and restricted scholarships. Library expenditures are included among academic support expenditures. This procedure should permit us to identify changes in the pattern of expenditures under the direct control of the management of higher education. But, as a result of this convention, direct comparisons of expenditure shares from our analysis to similar prior studies (e.g., Bowen 1980; Snyder 1988; Hauptman 1990a) are not possible.

A word of caution about HEGIS/IPEDS data is necessary. Changes in accounting practices or teaching methods over time can cause some changes in expenditure patterns to be little more than a mirage. For example, if throughout the 1980s institutions of higher education systematically began to develop separate accounts for public service as their accounting systems matured,

match the expenditures incurred as a result of the research projects. Much of the debate centers on what expenditures would be incurred by the college or university in the absence of sponsored research. The answer undoubtedly varies with the intensity of the institution's sponsored research program. Although a single externally funded grant might be accommodated with otherwise existing facilities at a small college, massive sponsored research programs undoubtedly call for additions to an institution's infrastructure.

15. Some would argue, e.g., that need-based aid formulas, which establish need on the basis of tuition less ability to pay, reduce the sensitivity of higher education management to increased cost because the costs can be recovered through tuition hikes that do not affect the amount *all* students or their families must pay.

16. Expenditures represent opportunity costs only if resources are acquired at competitive prices, i.e., at prices that reflect their opportunity cost accurately. Although some important inputs to college and university education seem to be sold in fairly competitive markets (e.g., faculty, construction work, housekeeping and groundskeeping services, personal computers, law enforcement, and fund-raising services), the extent of competition in other input markets is less clear (e.g., mainframe computers, library books and serials, electricity, and communication services).

much of the public service that was reported in the instruction category in 1978–79 would have moved to a separate public service category by 1987–88. Not only will the rise in reported public service expenditures therefore be misleading, but the decline in instruction will also not reflect any real change in the use of resources.

As colleges and universities shift their emphasis from mainframe academic computers to personal computers, expenditure patterns will also change. Mainframe computers are included in academic services, while most personal computers are included in the instruction account. It is possible that category shares may shift while in reality computing retains a stable share of AE&G expenditures.

Looking at the period 1978–79 to 1987–88 as a whole, the most obvious trend in expenditure patterns is the declining importance of the core areas of a college or university—instruction, academic support, and plant operations. The share of AE&G accounted for by these three areas combined declined from 71.3 to 68.9 percent over the period, continuing a trend evident from at least 1967–68 (Cheit 1971, table 2, pp. 32–33). Though not dramatic, this decline is certainly meaningful if the trend should continue.

Where has this money gone? The most rapid increase has been in internal (unrestricted) scholarships. Also increasing at a noticeable rate over the period is the share of expenditures devoted to student services (about 9 percent) and institutional support (about 6 percent).

The decline in the share of expenditures going to the core areas is less in Two-Year institutions than in four-year institutions, primarily because the plant operations expenditures of Two-Year institutions have kept pace with total expenditures. Two-Year institutions do not spend much on internally funded scholarships, nor has this category increased nearly as rapidly as it has in four-year institutions. Expenditures devoted to student services, on the other hand, have increased significantly as a share of the total over the decade at Two-Year institutions, rising from 8.6 to 10.3 percent.

The effect of excluding sponsored research and external scholarships from E&G expenses can be assessed. Because both categories increased relative to total AE&G for both four-year and Two-Year institutions, their inclusion in AE&G would cause the share of each of the other categories either to increase less or to decline more over the period. With sponsored research and external scholarships in the picture, the core areas would have lost an even greater share of expenditures.

Responsibility for the increase in the cost of higher education, however, may be hidden by changes in expenditure shares because a great deal of the increase in costs may arise from a large expenditure category that is increasing at slightly less than the rate of increase in total AE&G costs. Furthermore, the real value of almost *all* expenditure categories increased over the period 1978–79 to 1987–88.

12.5 Expenditures per Student

Expenditures per student for each cost category will help identify responsibility for the real cost increases over the decade. Our expenditures are in 1987–88 dollars, deflated by the gross national product (GNP) implicit price deflator (U.S. Council of Economic Advisers 1990, 298), a broad representation of input prices. We use the GNP implicit price deflator rather than either the consumer price index (CPI) or the higher education price index (HEPI) (Research Associates of Washington 1989) because the GNP deflator provides a standard economywide production cost index against which to evaluate changes in the costs of higher education. The CPI is more appropriately used to evaluate tuition inflation because it reflects the prices of goods and services that students and their families might have purchased instead of a college education. Using the HEPI to deflate expenditures could overstate or understate the extent to which inflationary price increases for inputs have put higher education cost inflation beyond the control of colleges and universities. The prices of certain inputs with large weights in the HEPI (e.g., faculty salaries)[17] are determined, in part, by the behavior of colleges and universities themselves. If they compete more vigorously for faculty, attempting to "raid" rivals, the HEPI will rise. Thus, the HEPI does not represent the uncontrollable increase in the cost of higher education because, to some degree, colleges and universities can influence its level.

Our measure of full-time-equivalent students is the sum of full-time students and one-third the number of part-time students. We combine baccalaureate, master's, Ph.D., and postbaccalaureate professional degree students as if each were equally costly. A more sophisticated analysis would sort out the effects of enrollment mix on college costs. Degree-mix data for our sample are available, but degree mix does not reflect enrollment mix. Some departments, such as English, history, and mathematics, account for a substantially higher fraction of enrollments than degrees. Furthermore, costs vary by level of instruction in undergraduate education (Brinkman 1989; Berg and Hoenack 1987) as well as between undergraduate and graduate students. Thus, it would be fairly complicated to construct a more accurate measure of full-time-equivalent enrollment. We adopted the simpler approach, at the risk of some inaccuracy. The important differences in cost per student between undergraduate and graduate education are controlled, in part, by our separation of insti-

17. Faculty salaries constituted 33.3 percent of the E&G expenditures of colleges and universities in 1983. The demand for certain other professional occupations is also dominated by colleges and universities, e.g., graduate assistants, extension and public service personnel, and college and university administrators. These professionals accounted for an additional 13.0 percent of 1983 E&G. Thus almost half the HEPI consists of salaries and wages that are determined in markets dominated by colleges and universities. These salaries and wages are unlikely to be determined independently of the behavior of the institutions (see Research Associates of Washington 1989, pp. 11–12 and table 10).

tutions by Carnegie classification. Table 12.2 above reports expenditures per student for all institutions and separately for four-year and Two-Year colleges.

For the 2,045 institutions in our sample, AE&G expenditures increased by $1,752 (1987–88 dollars) per student over the period 1978–79 to 1988–89. This is a 27.5 percent increase in real expenditures per student, or 2.7 percent per year over and above the general rate of price increase of the GNP. Removing all scholarships from AE&G expenditures reduces the increase to $1,593 per student, or 2.5 percent per year over and above the general rate of price increase of gross national product (GNP).

The GNP implicit price deflator increased at an average annual rate of 5.2 percent during our period of analysis. The HEPI increased at an average annual rate of 7.2 percent over approximately the same period (Research Associates of Washington 1989). Thus, about 2 percentage points of the 2.7 percent per year increase in real expenditures per student can be accounted for by the especially high inflation in inputs used intensively by colleges and universities. From this perspective, the real cost increase over the period is more modest, exceeding the HEPI by only 0.7 percent annually. Over 70 percent of the real rate of increase in higher education expenditures per student can be attributed to the especially high price increases experienced by inputs used heavily in higher education. This, however, does not diminish the importance of the cost inflation because those paying additional revenues to cover the elevated costs may take little comfort in knowing that the source of their burden is higher prices for inputs rather than additional input purchases. Furthermore, at least some of the input cost inflation may have been caused by the behavior of colleges and universities themselves.

The increase of $1,752 per student over the period is decomposed in row 4 of Table 12.2. There we report the share of the $1,752 accounted for by increases in the real cost per student for each expenditure category. Row 5 repeats the 1987–88 expenditure shares of each function in order to facilitate interpretation of the decomposed increase. Categories contributing more than their expenditure share to the increase have experienced growth in real expenditure per student exceeding the rate of increase of total expenditures. Those contributing less than their expenditure share grew slower than overall AE&G.

Instructional expenditures rose at a rate of 2.4 percent annually in excess of the GNP implicit price deflator for all colleges and universities in our sample. Although this is a hefty rate of increase, it is not unprecedented. In a study of the tuition and costs of three private research universities since the beginning of the century, Bowen (1968) found that, during normal peacetime periods, instructional costs per student increased at about 6 percent above the GNP deflator. From 1949 through 1966, the difference was slightly more than 5 percent. In contrast, instructional costs for Research universities increased only 2.6 percent per year faster than the GNP deflator over the period 1978–79 to 1988–89.

Although instruction and self-supported research expenditures account for the largest share of increased expenditures per student, 42.1 percent, these expenditures have not been growing as rapidly as total AE&G. Thus, real expenditures on some other college and university functions must have increased more rapidly over the period. Those categories with faster increases are institutional support (general administration), internal scholarships, student services, and, to a lesser degree, academic support. In sum, the evidence points to college-supported financial aid, general administrative expenses, and student services as the fastest-growing cost components. Instruction, however, still deserves considerable attention because it accounts for over 40 percent of the increase in costs.

AE&G expenditures rose at an annual clip of 2.9 percent at four-year institutions and 2.1 percent at Two-Year colleges. The pattern, as well as the rate, of cost increases also differs between four-year and Two-Year institutions, primarily because of a large decline in interest expenses over the period for Two-Year colleges. The increase in institutional support and student services was larger in Two-Year colleges than at four-year schools. Historically, Two-Year colleges allocated little unrestricted money to scholarships, and that policy did not change during the 1980s.

12.6 Cost Trends by Carnegie Classification

We expect the pattern of expenditures by function to vary depending on the institution's mission. The Carnegie classifications usefully distinguish institutions with different missions. Within the Carnegie classifications, however, there is at least one very important difference in the output mix of institutions, namely, the presence or absence of an on-campus medical school. Research universities can be used to illustrate the problem.

Expenditure shares and expenditures per student for each functional category are reported in Table 12.3 for Research universities with medical schools and those without, looking separately at public and private institutions. Institutions with medical schools exhibit quite different patterns than those without. The public universities with medical schools spend 34 percent more per student than their public counterparts without medical schools. The difference in total AE&G expenditures per student for private research universities with and without a medical school parallels that for the public institutions, but the composition of the cost elevation differs. For both public and private institutions, instructional costs per student are 44 percent higher at universities with medical schools. In Chapter 14, we show that these higher instructional costs at universities with medical schools are caused by greater expenditures on instructional resources other than full-time faculty salaries (e.g., fringe benefits, support staff, and equipment), rather than by differences in average faculty salaries or student/faculty ratios. For categories other than instruction, the pattern of cost differences at public universities diverges from the pattern

Table 12.3 **Distribution of Adjusted Educational and General (AE&G) Expenditures and AE&G Expenditures per Full-Time-Equivalent (FTE) Student, Research Universities by Medical School Status, 1987–88**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Public research universities:									
Distribution of AE&G:									
Without med school (N = 36)	.464	.112	.118	.054	.098	.112	.022	.021	1.000
With med school (N = 30)	.502	.088	.136	.044	.095	.098	.022	.014	1.000
AE&G expenditures per FTE student:									
Without med school (N = 36)	4,468	1,074	1,136	516	945	1,074	208	206	9,627
With med school (N = 30)	6,456	1,138	1,744	567	1,228	1,261	289	181	12,864
Private research universities:									
Distribution of AE&G:									
Without med school (N = 7)	.462	.008	.112	.066	.159	.115	.069	.010	1.000
With med school (N = 17)	.502	.026	.104	.041	.120	.099	.086	.022	1.000
AE&G expenditures per FTE student:									
Without med school (N = 7)	8,441	143	2,046	1,200	2,899	2,095	1,252	188	18,264
With med school (N = 17)	12,130	626	2,515	994	2,892	2,388	2,065	535	24,145

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officers.

at privates. The presence of a medical school seems to elevate expenditures for academic support, student services, and institutional support more at public than at private Research universities. Indeed, expenditures per student for student services and general administration are lower at those private Research universities with medical schools than at those without. In contrast, public service commitments and self-supported scholarship expenditures leap upward as a private university acquires a medical school on campus but rise only moderately as one turns from public institutions without a medical school to those with one.

Because the institutions with medical schools have a substantially different pattern and level of costs, we exclude the 72 universities that include medical schools in their HEGIS/IPEDS statistics from most of the analysis in this chapter. Universities with medical schools are examined again in parts of Chapters 13 and 14. Note, however, that some universities with medical schools report figures for the medical campuses separately (e.g., Cornell, Texas, Tennessee, and Penn State). Thus, their main campus figures may be compared fairly with other campuses that do not have medical schools.

Expenditure shares can be expected to vary depending on the emphasis that various institutions place on different goals. We should expect public institutions to accept a relatively greater public service responsibility, for example, and Research and Doctorate-Granting institutions to place greater emphasis on research and graduate education. The implications of different missions for expenditures on the various functions of a college or university, however, are not obvious. What effect, if any, does an emphasis on research have on the share of expenditures committed to general administration (i.e., institutional support)? How does the relative importance of student services differ between liberal arts colleges that enroll primarily full-time undergraduate students and either Research universities, which have a much larger proportion of graduate and professional students, or Two-Year colleges, which have a much larger number of part-time students?

Tables 12.4 and 12.5 help answer such questions by reporting expenditure shares and expenditures per student in 1978–79 and 1987–88 for institutions (without a medical school) by Carnegie classification. As disclosed in table 12.5, among the four-year institutions, the rate of increase in expenditures per student is highest at Liberal Arts I institutions (4.7 percent annually) and lowest at Comprehensives (2.4 percent annually). At Research, Doctoral, and Other-Four-Year institutions, AE&G grew at annual rates of 2.8, 2.6, and 2.7 percent, respectively, over the period.

Instruction takes a larger relative share of expenditures at Two-Year colleges than at any of the types of four-year institutions, which is to be expected in view of their primary teaching mission. Research, Doctoral, and Comprehensive institutions allocate almost half of AE&G to instruction, although one must interpret these proportions carefully. If Research and Doctoral institutions allocate relatively more discretionary resources to research (James 1978), the actual fraction of expenditures that directly supports teaching will

Table 12.4 **Distribution of Adjusted Educational and General (AE&G) Expenditures, Four-Year Institutions without On-Campus Medical Schools, 1978–79 and 1987–88, by Carnegie Classification**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Research (N = 43):									
1978–79	.473	.107	.115	.049	.099	.117	.023	.016	1.000
1987–88	.464	.099	.117	.055	.106	.112	.027	.020	1.000
Change	−.009	−.008	+.002	+.006	+.007	−.005	+.004	+.004	.000
Doctoral (N = 81):									
1978–79	.500	.045	.101	.066	.118	.118	.031	.020	1.000
1978–88	.480	.040	.110	.069	.131	.106	.046	.018	1.000
Change	−.020	−.005	+.009	+.003	+.013	−.012	+.015	−.002	.000
Comprehensive (N = 513):									
1978–79	.489	.019	.095	.081	.134	.127	.026	.029	1.000
1987–88	.474	.024	.097	.087	.147	.112	.040	.020	1.000
Change	−.015	+.005	+.002	+.006	+.013	−.015	+.014	−.009	.000
Liberal Arts I (N = 131):									
1978–79	.407	.009	.088	.097	.175	.138	.064	.023	1.000
1987–88	.372	.008	.087	.108	.184	.113	.110	.019	1.000
Change	−.035	−.001	−.001	+.011	+.009	−.025	+.046	−.004	.000
Other-Four-Year (N = 352):									
1978–79	.382	.013	.078	.105	.203	.138	.058	.023	1.000
1987–88	.344	.011	.076	.116	.209	.119	.105	.020	1.000
Change	−.038	−.002	−.002	+.011	+.006	−.019	+.047	−.003	.000

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

be less than the 46 or 48 percent reported for instruction by Research and Doctoral institutions, respectively. The HEGIS/IPEDS data cannot detect changes in faculty time allocation between teaching and research. Consequently, we cannot shed additional light on the validity of accusations (Sykes 1988) that faculty have reduced their commitment to teaching in order to devote greater attention to research in recent years.

What is most surprising about the instructional budget is the relatively low proportion of total expenditures allocated to it at liberal arts colleges. Instruction's share of expenditures has declined steadily at both Liberal Arts I and Other-Four-Year (Liberal Arts II) institutions. With an AE&G base excluding internally funded scholarships, instruction's share at Liberal Arts I colleges has declined from 53.5 percent in 1967–68 (Cheit 1971, table 2, pp. 32–33) to 43.5 percent in 1978–79 and only 41.8 percent in 1987–88.[18] Comparable fractions for Other-Four-Year colleges are 50.1 percent (1967–68), 40.6 percent (1978–79), and 38.4 percent (1987–88). This modest role for instructional expenditures occurs in spite of the fact that the liberal arts colleges have the lowest student/faculty ratio (and thus the most faculty per student), as we demonstrate in Chapter 14.

If liberal arts colleges spend a smaller share of their budgets on instruction and self-supported research, what accounts for a larger share of their budgets? The answer is not public service or deans, computers, and libraries, on which they also spend relatively little. It is, rather, student services, institutional support, and unrestricted scholarships. Liberal arts colleges, almost all of which are private, allocate relatively more to admissions, counseling, placement, student health and recreation, central administration, alumni relations and fund-raising, security, and scholarships than do other types of colleges and universities. These are student-oriented institutions, and it is apparent in their pattern of expenditures.[19]

Public service expenditures are significant only for Research and Doctoral institutions, the two Carnegie categories that include most large state universities. Academic support is relatively more important at the Research and Doctoral universities and least important in the less selective liberal arts colleges and Two-Year colleges. The more sophisticated library and academic computing requirements of large research-oriented universities apparently outweigh any scale economy advantages in these areas that such institutions may enjoy from their size.

18. The calculations for instruction divided by AE&G minus internal scholarships for 1978–79 and 1987–88 are based on data in Table 12.4.

19. In some cases, the demand for additional student services comes directly from students in the form of protests and requests by activist student groups. Relatively small but vocal groups can obtain favored benefits by pressuring administrators. They can raise the cost to administrators of failing to comply with the requests by threatening action (e.g., confrontation) that will occupy a great deal of administrators' time. At the same time, the costs of the added services are spread sufficiently over the entire student body that it is not in the interest of other students to oppose the added services. Little by little, services directed at various small constituencies accumulate and raise the overall cost of student services.

Table 12.5 **Adjusted Educational and General (AE&G) Expenditures per Full-Time-Equivalent Student in Constant 1987–88 Dollars, Institutions without On-Campus Medical Schools, 1978–79 and 1987–88, by Carnegie Classification**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Research (N = 43):									
1978–79	3,774	853	920	390	786	934	184	130	7,792
1987–88	4,739	1,011	1,198	563	1,078	1,144	279	205	10,216
Change	+965	+158	+278	+173	+292	+210	+95	+75	+2,244
Share of increase	43.0	7.0	12.4	7.7	13.0	9.4	4.2	3.3	100.0
Share of AE&G expenditures, 1987–88	46.4	9.9	11.7	5.5	10.6	11.2	2.7	2.0	100.0
Doctoral (N = 81):									
1978–79	3,148	280	638	417	744	741	198	128	6,294
1987–88	3,790	318	866	548	1,031	834	366	145	7,898
Change	+642	+38	+228	+131	+287	+93	+168	+17	+1,604
Share of increase	40.0	2.4	14.2	8.2	17.9	5.8	10.5	1.1	100.0
Share of AE&G expenditures, 1987–88	48.0	4.0	11.0	6.9	13.1	10.6	4.6	1.8	100.0
Comprehensive (N = 513):									
1978–79	2,647	103	515	436	724	688	140	156	5,409
1987–88	3,156	160	643	577	980	748	266	130	6,661
Change	+509	+57	+128	+141	+256	+60	+126	−26	+1,252
Share of increase	40.7	4.6	10.2	11.3	20.4	4.8	10.1	−2.1	100.0

Share of AE&G expenditures, 1987–88	47.4	2.4	9.7	8.7	14.7	11.2	4.0	2.0	100.0
Liberal Arts I (N = 131):									
1978–79	3,452	74	743	821	1,482	1,172	539	198	8,482
1987–88	4,787	98	1,114	1,386	2,365	1,447	1,421	240	12,858
Change	+1,335	+24	+371	+565	+883	+275	+882	+42	+4,376
Share of increase	30.5	.5	8.5	12.9	20.2	6.3	20.2	1.0	100.0
Share of AE&G expenditures, 1987–88	37.2	.8	8.7	10.8	18.4	11.3	11.0	1.9	100.0
Other-Four-Year (N = 352):									
1978–79	2,432	80	499	666	1,291	876	372	146	6,362
1987–88	2,781	89	611	940	1,690	965	848	162	8,086
Change	+349	+9	+112	+274	+399	+89	+476	+16	+1,724
Share of increase	20.2	.5	6.5	15.9	23.1	5.2	27.6	.9	100.0
Share of AE&G expenditures, 1987–88	34.4	1.1	7.6	11.6	20.9	11.9	10.5	2.0	100.0

Source: Computations by authors based on HEGIS/IPEDs.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

Student services are least important at the large Research and Doctoral universities. Institutional support, or general administrative expenses, increase as a share of the total budget as one moves from Research and Doctoral institutions to Comprehensive universities, to liberal arts colleges, and on to Two-Year colleges. This is somewhat surprising in view of the typical stereotype of the administrative bureaucracy of large research universities and the image of a personalized, streamlined administration at liberal arts colleges, where there is often only one layer of management between faculty members and the president.

Unrestricted scholarships, a form of private redistribution of income among students, are most important at private liberal arts colleges and are growing rapidly. The rapid growth in scholarship aid from unrestricted funds at the Liberal Arts I colleges may be a response to the growing tuition difference between private and public colleges. It may be a matter of survival for many of the Other-Four-Year colleges. In many cases of need-based aid, it permits an institution to "cut prices" to students who otherwise might not enroll.

Changes in expenditure shares by Carnegie classification over the decade are reported in table 12.4. The reduced relative emphasis on the core activities of colleges and universities is most pronounced at private liberal arts colleges. Collectively, the share of expenditures accounted for by instruction, academic support, and plant operations declined by 6.1 percentage points for Liberal Arts I colleges and 5.9 percentage points for Other-Four-Year institutions from 1978–79 to 1987–88. An almost equal increase in share occurs in student services and internal scholarships, two categories that reflect efforts to recruit students.

The pinnacle of the college age cohort in America occurred early in the period covered by this study. By 1990, however, the downturn in the number of college-age Americans did not result in declining aggregate enrollments (Evangelauf 1991). The shrinking college age cohort had been widely predicted, and the increasingly intense competition for students resulting from anxiety about it undoubtedly helped mitigate its effect on enrollments. Heavy recruiting, creative program design, and generous financial aid assistance all helped increase the enrollment rate of students during the 1980s sufficiently to delay the inevitable day, probably in the early 1990s, when the absolute number of students enrolled in American colleges and universities will decline.

As the gap in tuition between public and private colleges widens, it becomes increasingly difficult for private colleges to maintain enrollment levels if students and their families are price sensitive. Recruiting efforts have focused on high school students, who usually have a role in the decision about which college they attend but often do not shoulder the financial responsibility for tuition and fees directly (they do, of course, bear the burden of forgone earnings). As a result of intense competition for students, campuses have been spruced up with bark mulch and pine needles, remodeled dormitory rooms are fitted with telephones and cable television connections, and student recreation

centers and health clinics are expanded to meet increasing demand by students.[20] The costs of these added amenities and intensified recruitment efforts eventually show up as tuition increases.[21] Because the students who make the enrollment decisions pay little tuition directly, the (expected negative) effect of tuition hikes on enrollments may be quite modest.[22] Thus, there may have been little downside risk to many institutions for undertaking considerable expense to improve the comfort and type of life experienced by their students.

Most important in recruiting is financial aid. What clearly occurred in the (almost exclusively private) liberal arts colleges throughout the decade is a redistribution of the tuition burden among college students, from those who are able to pay and who have strong or ordinary academic qualifications to those who cannot pay (need-based aid) and to those who can pay but who have outstanding academic qualifications (academic merit aid). Competition for students via merit scholarships and the quest for a diversified student body intensified over the decade, and the results are evident in the proportion of expenditures these schools allocate to need-based and merit scholarships. The institutions hardly have a choice if they wish to maintain their image. If they do not offer sufficiently tempting financial aid packages to attract a diversified class of academically strong students, they will lose their image (and perhaps the reality) of being selective and equally desirable to students of all economic backgrounds, and the demand for places at them may dry up as less expensive public Comprehensive universities begin to attract their prospective high-quality students.

The net effect of the intensifying scholarship competition is that real resource costs are not increasing as much at liberal arts colleges as it first appears (3.9 percent annually if both restricted and unrestricted scholarships are excluded from AE&G). Scholarships are expenditures that are recycled as tuition payments. Nevertheless, even after accounting for the fact that unrestricted scholarships do not represent the sacrifice of real resources, there has been a substantial reallocation from instruction to student services and institutional support in liberal arts colleges, and costs have risen sufficiently rap-

20. Ernest Boyer (1987) reports that more than 60 percent of prospective college students responding to a recent Carnegie Foundation survey considered the appearance of the campus to be most crucial in their choice of college. Boyer concludes that "the facilities of a college are vitally important in the recruitment of its students . . . [and that the] director of facilities is more important to the survival of the institution than the academic dean" (p. 25). To the extent that competition among colleges for a shrinking college age population has been manifested in buildings-and-grounds improvements, however, the effect has not been sufficiently large to dislodge plant operations as the *slowest*-growing cost category for almost all types of institutions. Improved management, modest increases in the costs of plant operations inputs, and neglect of less visible maintenance needs have all likely contributed to the stability of plant operations costs.

21. The costs of added amenities show up in tuition unless, of course, they are extracted from other budget categories or are covered by nontuition revenue sources earmarked exclusively for the amenities.

22. The responsiveness of enrollment to tuition increases has generally been found to be "inelastic." That is, the percentage decline in enrollment is less than the percentage increase in tuition that precipitated it (see Chapter 3).

idly that scholarships do not account for more than one-fifth of the increase in expenditure per student at those institutions. Increased scholarship aid is far from the sole answer to why costs have been rising so fast at private liberal arts colleges.

Over the decade, AE&G expenditures per student outpaced the rate of input inflation, as measured by the GNP implicit price deflator, by 2.7 percent annually for all types of colleges and universities and grew almost 1 percentage point (0.7, to be precise) per year above the HEPI. Because the rate of increase in expenditures per student at Liberal Arts I colleges has been so much greater (4.7 vs. 2.7 percent for all institutions), however, even after accounting for the growth in unrestricted scholarships at those institutions (a 3.9 vs. a 2.6 percent growth rate for all colleges and universities), there must be something unusual happening at our selective private liberal arts colleges. Whatever the problems that such institutions face in maintaining revenues from nontuition sources (e.g., endowment income, gifts, and grants) that may be forcing tuition to bear relatively more of the revenue burden, and beyond the increased financial aid that they have made available to their students, real expenditures per student are rising very rapidly at these colleges.

12.7 The Extremes of Expenditure Changes

At all types of institutions, student services and institutional support have been increasing more rapidly and plant operations expenditures less rapidly than total AE&G. The control of plant operations expenses at all but the Research universities and Liberal Arts I colleges is remarkable.

The stability of energy costs from 1978–79 to 1987–88 contributed substantially to the control of plant operations costs over the decade. Periodic surveys by the Association of Physical Plant Administrators (1980, 1989) report utility costs per square foot. Surveys were conducted for both 1978–79 and 1987–88..The *nominal* average annual percentage rates of increase in utility costs per square foot for a sample of institutions reporting in both years are as follows: Research (6.0 percent), Doctoral (3.8 percent), Comprehensive (4.0 percent), Liberal Arts I (6.1 percent), Other-Four-Year (7.3 percent), and Two-Year institutions (5.1 percent). The GNP implicit price deflator increased at an average annual rate of 5.2 percent over the period. Utility expenses account for roughly 30–40 percent of plant operations expenditures. Thus, it is clear that the trend in energy prices over the period (or, more precisely, the particularly high energy prices in 1978–79) explains a good deal of the stability of plant operations expenditures.

Further savings in plant operations may have been achieved by deferring needed maintenance. The accumulation of deferred maintenance could eventually necessitate repair and replacement expenditures even larger than the net present value of those that would be required to maintain the physical plant of colleges and universities in a timely fashion. Between 1950 and 1975, the

physical space in higher education tripled (Rush and Johnson 1989, 6). As a result, a great deal of physical plant and equipment is now at an age when refurbishing is required. The 1988 physical facility renewal and replacement needs of colleges and universities were estimated at $60 billion, with $20.5 billion of that representing "urgent" repairs and renovations (Rush and Johnson 1989). How much is really urgent is difficult to judge.

The increased expenditures on student services and institutional support are more difficult to evaluate. They may reflect a market response to changing demands from students, whose values shifted toward increased counseling and health services, and they could reflect increased demand for campus security. The increase in institutional support could reveal an acceleration in private fund-raising efforts of colleges and universities in reaction to the diminished tax incentive to contribute to colleges and universities caused by declining marginal income tax rates (Clotfelter 1990) or the increased cost of complying with government regulations and responding to private litigation. Likewise, these increases might reflect an increase in self-canceling marketing efforts of colleges chasing a shrinking population of college age students or simply a proliferation of administrators (Hansen and Guidugli 1990; Galambos 1988).

The HEGIS/IPEDS data are not sufficiently detailed to disentangle these hypotheses. In a recent survey of 428 colleges and universities, a majority of financial officers singled out five detailed categories of expenditures as growing faster than the rate of inflation: insurance, marketing and recruiting, computing equipment and facilities, administrative computing, and complying with government regulations (Chaney and Farris 1990). Fund-raising was the sixth most frequently mentioned category. Although it would be useful to compare these university administrators' perceptions with the facts, cost allocation problems imply that such a time-series analysis will be both difficult and costly to perform (Cambridge Associates 1990).

12.8 Disaggregation

The primary danger in attempting to draw conclusions from differences in expenditure patterns and expenditures per student across Carnegie classifications is that institutions differ systematically in more ways than one. For example, there are very few public liberal arts colleges in our sample (only two of 131 in Liberal Arts I and only 22 of 430 Other-Four-Year colleges).[23] Thus,

23. The primary criterion for identifying liberal arts colleges in the Carnegie classification is the proportion of undergraduate degrees awarded in the liberal arts (vis-à-vis professional programs). A minimum of 50 percent is required to qualify for the Liberal Arts I category. The Liberal Arts II category, which we relabel "Other-Four-Year," has a similar standard, except for institutions with a total enrollment of fewer than 1,500. All four-year institutions with an enrollment of less than 1,500 that do not qualify for the Research, Doctoral, or Liberal Arts I categories are placed in Liberal Arts II. The two public Liberal Arts I colleges in our sample are the State University of New York at Purchase and the Virginia Military Institute. Large numbers of students

a comparison between Comprehensive and Liberal Arts I institutions risks attributing financial differences to an institution's mission when in reality they reflect differences between publicly and privately controlled schools. Likewise, only one Liberal Arts I college in our sample has more than 3,000 full-time-equivalent students (Bucknell). Thus, a comparison by Carnegie classification may reveal as much about the effects of size as of mission.

Consequently, we reclassified the 2,045 institutions in our sample into 24 separate categories, which we believe are fairly homogeneous groups. In no case do we combine public with private institutions, and in only a few cases do we combine colleges into different Carnegie codes. These few cases involve the public Liberal Arts I and Liberal Arts II (which we call Other-Four-Year) institutions. A careful examination of the 24 public institutions[24] in the liberal arts categories convinced us that all but a few are actually small comprehensive institutions (Breneman 1990).[25] For simplicity, therefore, we moved the 24 public liberal arts colleges into the public Comprehensive classification for subsequent analysis. An examination of expenditure patterns of institutions with and without medical schools in each of our groups convinced us of the necessity to segregate those universities in our sample which have on-campus medical schools. This created six additional categories, as there are both public and private Research, Doctoral, and Comprehensive institutions with medical schools on campus. Finally, to keep the number of cells in our distribution manageable, we sometimes combined institutions of different sizes into a single group, especially when a finer disaggregation left relatively few observations in individual cells.

The 24 resulting categories are identified in Table 12.6. The table provides examples of institutions in each category. The structure of the combinations can be understood better with the help of Table 12.7, which shows the grouping that we used to form the categories and also reveals the cells that contain no institutions (e.g., private liberal arts colleges with 20,000 or more students).

This new grouping of institutions enables us to focus more clearly on the important differences among colleges and universities. For example, in Table 12.8 and 12.9, we report the distribution of expenditure shares and the expenditure per student for four of the Carnegie classifications, holding approximately constant control (they are all public), medical school status (none has a medical school), enrollment size, and the growth rate of enrollment (re-

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are educated in colleges of liberal arts, letters and science, or arts and sciences at Research, Doctoral, and Comprehensive universities. The undergraduate liberal arts program at those institutions, however, either is surrounded by a major research or doctoral program or awards fewer than half the institution's undergraduate degrees.

24. It is purely coincidental that both our number of institutional categories and the number of public liberal arts colleges are 24.

25. Most are called "comprehensive" universities in *Peterson's Guide to Four Year Colleges*, and most appear to have significant professional degree programs, the primary criterion that distinguishes them from liberal arts colleges.

Table 12.6 **Twenty-Four Categories of Higher Education Institutions, Cross-Classified by Type, Size, and Control**

Category No.	Category	Enrollment Range	No. of Institutions	Examples
1	Public Research: no med school	8,000–33,000	36	Rutgers, Oregon
2	Public Research: with med school	11,000–38,000[a]	30	West Virginia, Wisconsin
3	Private Research: no med school	3,000–17,000[b]	7	Princeton, Carnegie-Mellon
4	Private Research: with med school	4,000–22,000	17	Harvard, Vanderbilt
5	Public Doctoral: no med school	4,000–20,000[c]	50	Mississippi, Clemson
6	Public Doctoral: with med school	6,000–20,000	10	Vermont, Louisville
7	Private Doctoral: no med school	2,000–15,000[d]	31	Fordham, Baylor
8	Private Doctoral: with med school	4,000–10,000	5	Tufts, Dartmouth
9	Public Comprehensive & Other-Four-Year: no med school	Under 1,000	17	Western Montana, Laredo State
10	Public Comprehensive & Other-Four-Year: no med school	1,000–2,999	101	Citidel, Evergreen State
11	Public Comprehensive & Other-Four-Year: no med school	3,000–9,999	170	Florida A&M, James Madison
12	Public Comprehensive: no med school	10,000–25,000	33	George Mason, San Diego State
13	Public Comprehensive: with med school	7,000–14,000	6	East Carolina, Marshall
14	Private Comprehensive: no med school	Under 3,000	160	Whittier, Rollins
15	Private Comprehensive: no med school	3,000–10,000	56	Bradley, Seton Hall
16	Private Comprehensive: with med school	1,000–7,000	4	Mercer, Wake Forest
17	Private Liberal Arts I: no med school	Under 1,000	40	Mills, Bennington
18	Private Liberal Arts I: no med school	1,000–3,000[e]	89	Williams, Grinnell
19	Private Other-Four-Year: no med school	Under 1,000	267	Transylvania, Hawaii Loa
20	Private Other-Four-Year: no med school	1,000–3,000[f]	63	Spellman, Wittenberg
21	Public Two-Year: no med school	Under 1,000	209	Penn State (Allentown), State Fair Community College
22	Public Two-Year: no med school	1,000–2,999	328	Eastern Arizona, Kilgore
23	Public Two-Year: no med school	3,000–16,000	213	Pasadena City, Milwaukee Area Technical
24	Private Two-Year: no med school	Under 3,000	103	College of Boca Raton, Chatfield

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Except University of California, San Francisco, 3,700.

[b]Except California Institute of Technology, 1,800.

[c]Except State Univeristy of New York Environmental Science Campus, 1,400, and Colorado School of Mines, 2,500.

[d]Except Northeastern University, 24,000.

[e]Except Bucknell, 3,200.

[f]Except Columbia College (Chicago), 3,600.

Table 12.7 **Counts of Institutions in Sample, Grouped into Twenty-Four Categories**

Carnegie Code and Medical School Status	Enrollment				
	0–999	1,000–2,999	3,000–9,999	10,000–19,999	20,000+
Public institutions:					
Research, no medical school[C1]			2	18	16
Research, medical school[C2]			1	13	16
Doctoral, no medical school[C5]		2	24	24	
Doctoral, medical school[C6]			5	3	2
Comprehensive, no medical school	2[C9]	93[C10]	169[C11]	30[C12]	3[C12]
Liberal Arts I, no medical school		2[C10]			
Other-Four-Year, no medical school	15[C9]	6[C10]	1[C11]		
Comprehensive, medical school[C13]			3	3	
Two-Year	209[C21]	328[C22]	197[C23]	16[C23]	
Private institutions:					
Research, no medical school[C3]		1	4	2	
Research, medical school[C4]			9	5	3
Doctoral, no medical school[C7]		5	21	4	1
Doctoral, medical school[C8]			4	1	
Comprehensive, no medical school	8[C14]	152[C14]	56[C15]		
Liberal Arts I, no medical school	40[C17]	88[C18]	1[C18]		
Other-Four-Year, no medical school	267[C19]	62[C20]	1[C20]		
Comprehensive, medical school[C16]	1	1	2		
Two-Year[C24]	93	10			
Count of institutions by size class	635	750	500	119	41

Source: Computations by authors based on HEGIS/IPEDS data.

Note: The twenty-four categories are described in Table 2.6. They are identified here by "C" numbers (e.g., C1 = category 1). Categories that comprise only one Carnegie classification are identified by "C" numbers in the stub column. If a category comprises more than one Carnegie classification, or if a Carnegie classification has been divided into one or more categories, the "C" numbers are given in the body of the table.

Table 12.8 **Distribution of Adjusted Educational and General (AE&G) Expenditures by Carnegie Classification, Holding Control, Medical School Status, Enrollment Size, and Enrollment Growth Rate Constant[a]**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[b]	Academic Support[c]	Student Services[d]	Institutional Support[e]	Plant Operations	Internal Scholarships[f]	Mandatory Transfers[g]	Total AE&G[h]
Research (N = 36):									
1978–79	.473	.119	.116	.047	.092	.117	.020	.016	1.000
1987–88	.462	.112	.118	.054	.098	.112	.022	.021	1.000
Change	−.009	−.007	+.002	+.007	+.006	−.005	+.002	+.005	.000
Doctoral (N = 50):									
1978–79	.509	.059	.106	.064	.107	.119	.016	.020	1.000
1987–88	.500	.053	.116	.069	.114	.110	.021	.018	1.000
Change	−.009	−.006	+.010	+.005	+.007	−.009	+.005	−.002	.000
Comprehensive (N = 203):									
1978–79	.514	.020	.100	.077	.114	.129	.014	.030	1.000
1987–88	.510	.028	.100	.081	.130	.116	.017	.018	1.000
Change	−.004	+.008	.000	+.004	+.016	−.013	+.003	+.012	.000
Two-Year (N = 213):									
1978–79	.524	.017	.075	.085	.150	.113	.004	.033	1.000
1987–88	.512	.021	.084	.102	.154	.115	.004	.008	1.000
Change	−.012	+.004	+.009	+.017	+.004	+.002	.000	−.025	.000

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes only publicly controlled institutions without a medical school; enrollment ranges 8,000–33,000, 4,000–20,000, 3,000–25,000 and 3,000–16,000 respectively; annual enrollment growth rates 0.79, 0.91, 0.98 and 0.64 respectively.

[b]Includes extension services.

[c]Computers, libraries, and deans.

[d]Admissions, registrars, counseling, student health, and recreation.

[e]Administration, accounting, security, alumni, and development.

[f]Scholarships from internal funds.

[g]Debt service.

[h]Total E&G expenditures under control of chief executive officer.

Table 12.9 **Adjusted Educational and General (AE&G) Expenditures per Full-Time-Equivalent Student by Carnegie Classification, 1978–79 and 1987–88, Holding Control, Medical School Status, Enrollment Size, and Enrollment Growth Rate Constant[a]**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[b]	Academic Support[c]	Student Services[d]	Institutional Support[e]	Plant Operations	Internal Scholarships[f]	Mandatory Transfers[g]	Total AE&G[h]
Research (N = 36):									
1978–79	3,609	907	888	362	706	891	152	121	7,636
1987–88	4,468	1,074	1,136	516	945	1,074	208	206	9,628
Change	+859	+167	+248	+154	+239	+183	+56	+85	+1,992
Share of increase	43.1	8.4	12.4	7.7	12.0	9.2	2.8	4.3	100.0
Share of AE&G expenditures, 1987–88	46.4	11.2	11.8	5.4	9.8	11.2	2.2	2.1	100.0
Doctoral (N = 50):									
1978–79	3,094	357	644	390	650	725	97	123	6,080
1987–88	3,523	376	817	471	804	778	149	124	7,041
Change	+429	+19	+173	+81	+154	+53	+52	+1	+961
Share of increase	44.6	2.0	18.0	8.4	16.0	5.5	5.4	.1	100.0
Share of AE&G expenditures, 1987–88	50.0	5.3	11.6	6.9	11.4	11.0	2.1	1.8	100.0
Comprehensive (N = 203):									
1978–79	2,705	110	526	407	601	677	75	160	5,261
1987–88	3,109	171	609	491	789	709	104	109	6,092

Change	+404	+61	+83	+84	+188	+32	+29	−51	+831
Share of increase	48.6	7.3	10.0	10.1	22.6	3.9	3.5	−6.1	100.0
Share of AE&G expenditures, 1987–88	51.0	2.8	10.0	8.1	13.0	11.6	1.7	1.8	100.0
Two-Year (N = 213):									
1978–79	1,963	64	281	318	561	425	13	123	3,749
1987–88	2,289	94	374	458	690	516	17	34	4,472
Change	+326	+30	+93	+140	+129	+91	+4	−89	+723
Share of increase	45.1	4.1	12.9	19.4	17.8	12.6	.6	−12.3	100.0
Share of AE&G expenditures, 1987–88	51.2	2.1	8.4	10.2	15.4	11.5	.4	.8	100.0

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes only publicly controlled institutions without a medical school; enrollment ranges 8,000–33,000, 4,000–20,000, 3,000–25,000, and 3,000–16,000, respectively; annual enrollment growth rates 0.79, 0.91, 0.98, and 0.64, respectively.

[b]Includes extension services.

[c]Computers, libraries, and deans.

[d]Admissions, registrars, counseling, student health, and recreation.

[e]Administration, accounting, security, alumni, and development.

[f]Scholarships from internal funds.

[g]Debt service.

[h]Total E&G expenditures under control of chief executive officer.

ported in the tables). What we learn from these comparisons for the most part confirms our earlier findings about changes in expenditures by Carnegie classification. Instruction accounts for the largest share of the increased expenditures per student at each type of institution, although its rate of increase is less than the rate of increase of total AE&G. We examine the instruction category in more detail in Chapter 14, where we continue to use this new grouping of institutions. Student services and institutional support grew faster than all AE&G in each group, and plant operations grew slower (except at Two-Year colleges). Growth in the academic support category of Doctoral institutions is more pronounced when the public institutions are examined separately.

12.9 Historically Black Colleges

The percentage of black Americans who achieved four or more years of college education increased from 4.8 in 1960 to 12.3 in 1988 (see Table 2.3 above). While white student college enrollment rates also increased since the Civil Rights Act was passed in 1964, black college enrollment rates increased faster. The result has been a modest rise in the proportion of all college students who are black and a significant increase in the number of black college students.

Before the 1960s, most black college students were served by a select group of institutions that catered especially to them. Seventy-one of these historically black institutions are among the 2,045 colleges and universities in our sample. Thirty-three of them are public Comprehensive universities enrolling between 1,000 and 3,000 students. Twenty-seven are private Other-Four-Year colleges (less selective liberal arts colleges) with 3,000 or fewer students. Five are private Comprehensive universities, and six are Two-Year colleges.

Ironically, these historically black colleges and universities did not thrive during the years of rising black student enrollments. Not only did more black students attend college, but also many blacks enrolled in what had traditionally been almost exclusively white institutions. The substitution away from historically black colleges was so strong that it overpowered the effect of an overall increase in black enrollments. Thirty-nine of the 71 historically black colleges in our sample actually lost enrollments from 1978–79 to 1987–88, and only 11 experienced average annual enrollment growth above 1.8 percent.[26] As we will argue more generally in the next chapter, declining enrollments cause expenditures per student to rise. This, coupled with the lower

26. Although many colleges and universities reported sharp declines in enrollment in fall 1990, the historically black colleges seem to have bucked the trend. Several reported a surge in enrollments, with increases in the 10–15 percent range. For some, this upward trend has been in place for several years. It appears that historically black colleges may have reached their lowest enrollments in the late 1980s (Wilson 1990, 1) and have entered a period of recovery.

income levels of many black families, has placed many of these historically black colleges in a severe financial squeeze.

We compare expenditures per student in 1987–88 at historically black colleges with all other colleges for three of our disaggregated categories of institutions in Table 12.10. These three groups contain 54 of the 71 historically black institutions in the sample.

For the public Comprehensive institutions, AE&G expenditures per student are higher at the historically black colleges. Each functional category contributes to the difference. On the other hand, the historically black private Other-Four-Year colleges spend less per student than their non-historically black counterparts. Here the pattern is not consistent across functions. The historically black colleges spend more per student on public service, institutional support, and plant operations,but they spend substantially less on instruction, libraries, student services,and internally funded scholarships. Although the financial need of the students attending these colleges in undoubtedly high, revenues from full-price students to fund unrestricted scholarship aid are limited.

12.10 Cost Trends by Institutional Control

Expenditure shares and expenditures per student are reported separately by public and private control in Tables 12.11–12.14. The declining role of instructional expenditures is predominantly a private school phenomenon. The larger public service responsibility of public colleges and universities is evident, but public service does not account for much of the increased costs in public institutions. The rising costs of student services and institutional support transcend control, but the sharp increase in internally funded scholarships shows up only at the private schools. Plant operations loses share at both public and private institutions.

Tables 12.13 and 12.14 contain several public/private comparisons for groups of institutions that are otherwise similar. Private Comprehensive universities are experiencing a much faster increase in costs than public Comprehensive institutions. In 1978–79, the privates were spending almost $500 less per student than their public counterparts, but, by 1987–88, they were spending almost $1,000 more. The public Comprehensives seem to have held the line on all expenditure categories except the instructional budget,while the privates experienced large increases in instruction, student services, institutional support, and unrestricted scholarships.

A similar pattern occurred in Two-Year colleges, where publics and privates spent about the same amount per student in 1978–79, but, by 1987–88, the privates were spending $900 more per student. The public Two-Year colleges experienced a significant increase in student services and institutional support expenditures—however, not nearly as large as the increase in those functional

Table 12.10 **Adjusted Educational and General (AE&G) Expenditures per Full-Time Equivalent Student, Selected Institutions without On-Campus Medical Schools, 1987–88, Historically Black versus Other Institutions**

	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Public Comprehensive:									
1,000–3,000 students:									
Historically black schools (N = 18)	3,387	339	801	761	1,405	1,055	238	81	8,066
Other schools	2,974	158	647	567	931	812	92	99	6,279
3,000–10,000 students:									
Historically black schools (N = 15)	3,303	256	759	563	1,225	1,007	221	−1	7,334
Other schools	2,890	205	613	453	752	712	117	149	5,892
Private Other-Four-Year under 1,000 students:									
Historically black schools (N = 24)	2,298	96	569	780	2,004	1,189	558	136	7,629
Other schools	2,661	69	564	1007	1,762	941	925	187	8,116

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

Table 12.11 **Distribution of Adjusted Educational and General (AE&G) Expenditures, Institutions without On-Campus Medical Schools, 1978–79 and 1987–88, by Control**

	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Public (N = 1,157):									
1978–79	.503	.046	.098	.072	.121	.122	.013	.025	1.000
1987–88	.494	.049	.102	.080	.130	.115	.015	.015	1.000
Change	−.009	+.003	+.004	+.006	+.009	−.007	+.002	+.010	.000
Private (N = 816):									
1978–79	.430	.012	.085	.089	.175	.124	.061	.025	1.000
1987–88	.395	.012	.089	.098	.183	.106	.096	.021	1.000
Change	−.035	−.000	+.004	+.009	+.008	−.018	+.035	−.004	.000

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

Table 12.12 **Adjusted Educational and General (AE&G) Expenditures per Full-Time-Equivalent Student, Institutions without On-Campus Medical Schools, 1978–79 and 1987–88, by Control**

	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Public (N = 1,157):									
1978–79	2,614	241	510	374	629	636	66	129	5,199
1987–88	3,054	303	631	492	801	712	93	95	6,182
Change	+440	+62	+121	+118	+172	+76	+27	−34	+983
Share of increase	44.8	6.3	12.3	12.0	17.5	7.7	2.7	−3.5	100.0
Share of AE&G expenditures, 1987–88	49.9	4.9	10.2	8.0	13.0	11.5	1.5	1.5	100.0
Private (N = 816):									
1978–79	2,853	76	565	588	1,158	823	401	165	6,627
1987–88	3,782	113	847	935	1,749	1,019	922	199	9,567
Change	+929	+37	+282	+347	+591	+196	+521	+34	+2,940
Share of increase	31.6	1.3	9.6	11.8	20.1	6.7	17.7	1.2	100.0
Share of AE&G expenditures, 1987–88	39.5	1.2	8.9	9.8	18.3	10.6	9.6	2.1	100.0

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

areas experienced by the privates. Almost everything except public service and interest expense rose for private Two-Year colleges over the period.[27]

The story is repeated with Doctoral institutions. The increase in expenditures per student was twice as large at private as at public Doctoral universities. Unrestricted scholarships, interest expense, and student services account for a disproportionate share of the increase.

Overall, real expenditures per student at public institutions increased 1.9 percent annually from 1978–79 to 1987–88, while they increased 4.2 percent annually at private colleges and universities. Expenditures per student increased much faster in private Doctoral, Comprehensive, and Two-Year institutions than in their public counterparts. This is consistent with the very high rate of increase in expenditures per student at private liberal arts colleges, for which there is no comparable public reference group.

12.11 When Did Costs Accelerate Most?

The pattern of cost inflation over the period 1978–79 to 1987–88 is not constant. Over the first five years (1978–79 to 1983–84), AE&G per student for the whole industry increased at an average rate of only 1.1 percent above the GNP implicit price deflator.[28] But, between 1983–84 and 1987–88, the average rate of increase rose to 4.8 percent per year (averaging 2.7 percent over the entire period). The greatest increase in costs occurred over the years 1983–84 to 1985–86, when AE&G per student rose at 7.0 percent per year above the GNP deflator. (This was followed by a more modest 2.6 percent average annual rate from 1985–86 to 1987–88). The forces driving higher education's cost inflation in the 1980s appear to have been most effective in the middle of the decade.

What apparently exacerbated the rate of increase in costs in the mid-1980s is public institutions joining the privates in experiencing rapid cost increases. Over the first five years of the period,the rate of increase in average costs for privates was 3.3 percent, which rose to 5.4 percent from 1983–84 to 1987–88. Public colleges and universities, on the other hand, held the line on costs over the first half of the period (0.3 percent per year) but then joined the privates, experiencing an average annual rate of increase of 4.5 percent from 1983–84 to 1987–88.

27. For an interesting analysis of the allocation of Alabama state education funds between two-year and four-year institutions and among two-year colleges and four-year institutions, see Long (1987). Long concludes that Alabama has too many state-supported colleges (53 in 1987), many enrolling far too few students to make effective use of facilities. He notes that Alabama's two-year colleges average only one-fifth the size of those in neighboring Florida (pp. iv-1).

28. The figures reported in this section are based on samples that include institutions with medical schools. The rates of change are only slightly different if the 72 institutions with medical schools are excluded. The only growth rates that differ by more than 0.2 percent are those for Research universities without medical schools whose AE&G per student increased at an average annual rate of 1.4 percent from 1978–79 to 1983–84 and 5 percent from 1983–84 to 1987–88.

Table 12.13 **Distribution of Adjusted Educational and General (AE&G) Expenditures, by Control, 1978–79 and 1987–88, Holding Carnegie Classification, Medical School Status, Enrollment Size, and Enrollment Growth Rate Constant**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Comprehensive institutions, no medical school:[h]									
Public (N = 118):									
1978–79	.452	.022	.101	.086	.156	.151	.013	.020	1.000
1987–88	.463	.028	.103	.091	.154	.130	.018	.014	1.000
Change	+.011	+.006	+.002	+.005	−.002	−.021	+.005	−.006	.000
Private (N = 160):									
1978–79	.424	.011	.072	.098	.184	.119	.062	.030	1.000
1987–88	.397	.009	.076	.110	.183	.104	.101	.020	1.000
Change	−.027	−.002	+.004	+.012	−.001	−.015	+.039	−.010	.000
Two-Year institutions:[i]									
Public (N = 209):									
1978–79	.501	.020	.102	.084	.151	.125	.006	.012	1.000
1987–88	.478	.023	.100	.105	.160	.119	.010	.005	1.000
Change	−.023	−.003	−.002	−.021	+.009	−.006	+.004	−.007	.000
Private (N = 103):									
1978–79	.361	.006	.074	.123	.217	.138	.039	.042	1.000
1987–88	.344	.004	.074	.139	.230	.131	.052	.026	1.000
Change	−.017	−.002	.000	+.016	+.013	−.007	+.013	−.016	.000

Doctoral institutions, with medical school:[j]									
Public (N = 10):									
1978–79	.502	.077	.121	.045	.105	.113	.010	.026	1.000
1987–88	.478	.086	.122	.043	.120	.101	.024	.026	1.000
Change	−.024	+.009	+.001	−.002	+.015	−.012	+.014	.000	.000
Private (N = 5):									
1978–79	.469	.029	.138	.050	.153	.110	.039	.011	1.000
1987–88	.454	.010	.142	.062	.147	.095	.058	.032	1.000
Change	−.015	−.019	+.004	+.012	−.006	−.015	+.019	+.021	.000

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension services.

[b]Computers, libraries, and deans.

[c]Admissions, registrators, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

[h]Enrollments less than 3,000 students; annual enrollment growth rates of 1.40 and 1.21 percent, respectively.

[i]Enrollments less than 1,000 students; annual enrollment growth rates of 1.42 and 1.13 percent, respectively.

[j]Enrollment ranges of 6,000–20,000 and 4,000–10,000, respectively; annual enrollment growth rates of 0.98 and 0.68, respectively.

Table 12.14 **Adjusted Educational and General (AE&G) Expenditures per Full-Time-Equivalent Student by Control, 1978–79 and 1987–88, Holding Carnegie Classification, Medical School Status, Enrollment Size, and Enrollment Growth Rate Constant**

Carnegie Classification	Instruction and Self-Supported Research	Public Service[a]	Academic Support[b]	Student Services[c]	Institutional Support[d]	Plant Operations	Internal Scholarships[e]	Mandatory Transfers[f]	Total AE&G[g]
Comprehensive institutions, no medical school:[h]									
Public (N = 118):									
1978–79	2,686	130	601	511	926	898	79	116	5,947
1987–88	3,036	184	673	597	1,013	852	116	92	6,562
Change	+350	+54	+72	+86	+87	−46	+37	−24	+615
Share of increase	56.9	8.8	11.7	14.0	14.1	−7.5	6.0	−3.9	100.0
Share of AE&G expenditures, 1987–88	46.3	2.8	10.3	9.1	15.4	13.0	1.8	1.4	100.0
Private (N = 160):									
1978–79	2,321	61	394	538	1,007	650	339	163	5,474
1987–88	2,988	65	570	830	1,380	783	759	150	7,526
Change	+667	+4	+176	+292	+373	+133	+420	−13	+2,052
Share of increase	32.5	.2	8.6	14.2	18.2	6.5	20.5	−.6	100.0
Share of AE&G expenditures, 1987–88	39.7	.9	7.6	11.0	18.3	10.4	10.1	2.0	100.0
Two-Year institutions:[i]									
Public (N = 209):									
1978–79	2,271	89	463	381	683	566	27	52	4,531
1987–88	2,633	128	549	580	880	654	54	26	5,505
Change	+362	+39	+86	+199	+197	+88	+27	−26	+974
Share of increase	37.2	4.0	8.8	20.4	20.2	9.0	2.8	−2.6	100.0
Share of AE&G expenditures, 1987–88	47.8	2.3	10.0	10.5	16.0	11.9	1.0	.5	100.0
Private (N = 103):									
1978–79	1,654	26	340	564	994	630	180	191	4,578
1987–88	2,201	24	475	892	1,473	837	331	164	6,397

Change	+547	−2	+135	+328	+479	+207	+151	−27	+1,819
Share of increase	30.1	−.1	7.4	18.0	26.3	11.4	8.3	−1.5	100.0
Share of AE&G expenditures, 1987–88	34.4	.4	7.4	13.9	23.0	13.1	5.2	2.6	100.0
Doctoral institutions, with medical school:[j]									
Public (N = 10):									
1978–79	4,139	639	996	375	863	933	84	216	8,247
1987–88	4,887	883	1,244	441	1,230	1,035	246	262	10,229
Change	+748	+244	+248	+66	+367	+102	+162	+46	+1,982
Share of increase	37.7	12.3	12.5	3.3	18.5	5.1	8.2	2.3	100.0
Share of AE&G expenditures, 1987–88	47.8	8.6	12.2	4.3	12.0	10.1	2.4	2.6	100.0
Private (N = 5):									
1978–79	5,688	358	1,669	612	1,856	1,330	468	139	12,120
1987–88	7,609	175	2,374	1,040	2,458	1,590	977	546	16,770
Change	+1,921	−183	+705	+428	+602	+260	+509	+407	+4,650
Share of increase	41.3	−3.9	15.2	9.2	12.9	5.6	10.9	8.8	100.0
Share of AE&G expenditures, 1987–88	45.4	1.0	14.2	6.2	14.7	9.5	5.8	3.2	100.0

Source: Computations by authors based on HEGIS/IPEDS data.

[a]Includes extension service.

[b]Computers, libraries, and deans.

[c]Admissions, registrars, counseling, student health, and recreation.

[d]Administration, accounting, security, alumni, and development.

[e]Scholarships from internal funds.

[f]Debt service.

[g]Total E&G expenditures under control of chief executive officer.

[h]Enrollments less than 3,000 students; annual enrollment growth rates of 1.40 and 1.21 percent, respectively.

[i]Enrollments less than 1,000 students; annual enrollment growth rates of 1.42 and 1.13, percent respectively.

[j]Enrollment ranges of 6,000–20,000 and 4,000–10,000, respectively; annual enrollment growth rates of 0.98 and 0.68, respectively.

The increases in average costs seem to have hit private liberals arts colleges first. Liberal Arts I colleges experienced average increases of 4.6 percent over the first five and 4.9 percent over the latter four years of the period. The comparable numbers for Other-Four-Year colleges are 2.3 and 3.2 percent, respectively. Most of the other categories of institutions held the line pretty well until 1983–84. The average annual rates of increase for Research, Doctoral, and Comprehensive universities from 1978–79 to 1983–84 were 1.8, 1.6, and 1.0 percent, respectively. Average costs at Two-Year colleges even declined relative to the GNP deflator over the period (by 0.4 percent annually). But the experience of these institutions from 1983–84 to 1987–88 was not much different from that of private liberal arts colleges, as their average annual rates of increase skyrocketed to 5.0, 3.9, 4.2, and 5.4 percent, respectively. Thus, one might ask what happened to private liberal arts colleges from 1978–79 to 1983–84 that eventually also infected public Research, Doctoral, Comprehensive, and Two-Year institutions a few years later.

12.12 Expenditures per Degree

By using the growth in AE&G expenditures per full-time-equivalent student in this analysis, we have assumed implicitly that a year's experience in college is equally productive regardless of the degree program or type of institution in which the student is enrolled. In addition, AE&G per full-time-equivalent enrollment treats each year of college equally; thus, the freshman experience is equated with the senior year (or even a year in law school or a Ph.D. program). It also implies that there is no special value to completing a degree. This assumption is not supported by the literature on screening, in which some of the benefits of education take the form of reduced costs to employers of evaluating and comparing prospective workers (Berg 1970; Taubman and Wales 1973).

Although some writers question the relevance of the screening function of higher education (Layard and Psacharopoulos 1974), most of the empirical evidence supports the idea that, among other things, higher education produces valuable credentials for its students. In particular, evidence exists that the internal rate of return to investment in a degree relative to two years of college is greater than the return to the first two years of postsecondary education (Becker 1964, 92–93). Although this observation could result from a more valuable educational experience during the last two years of a four-year degree than during the first two, it is also consistent with the credentialism hypothesis.

If we accept degrees as a measure of the output of higher education, the analysis can be recast in terms of the average annual rate of growth in AE&G expenditures per degree awarded. These calculations are reported in Table 12.15 for both samples, including and excluding institutions with on-campus medical schools. The sample is 2,023 rather than 2,045 because a few insti-

Table 12.15 **Average Annual Growth Rate of Adjusted Educational and General (AE&G) Expenditures per Full-Time-Equivalent (FTE) Student and per Degree, 1978–79 to 1985–86**

Institutions	Including Institutions with Medical Schools				Excluding Institutions with Medical Schools			
	Sample Size	% Growth AE&G per FTE Enrollment	% Growth AE&G per Degree	Ratio[a]	Sample Size	% Growth AE&G per FTE Enrollment	% Growth AE&G per Degree	Ratio[a]
All	2,023	2.8	2.9	.97	1,951	2.5	2.6	.96
Four-Year	1,180	2.9	3.1	.94	1,108	2.7	3.0	.90
Two-Year	843	2.0	1.6	1.25	843	2.0	1.6	1.25
Research	89	3.2	3.3	.97	42	2.7	2.9	.93
Doctoral	96	2.7	3.0	.90	81	2.6	2.9	.90
Comprehensive	517	2.5	3.0	.83	508	2.5	2.8	.89
Liberal Arts I	131	4.8	4.3	1.12	131	4.8	4.3	1.12
Other-Four-Year	347	2.9	2.6	1.12	346	2.9	2.6	1.12
Public	1,188	2.2	2.5	.88	1,142	2.0	2.3	.87
Private	835	4.1	3.8	1.08	809	4.0	3.6	1.11

Source: Calculations by authors based on HEGIS/IPEDS data.

[a]Ratio of average annual growth rate of AE&G per FTE enrollment to average annual growth rate of AE&G per degree.

tutions did not report degrees awarded. The period covers seven years, 1978–79 to 1985–86, because degree data for 1987–88 were frequently not reported. Average annual rate of growth calculations for AE&G expenditures per full-time-equivalent student for the same sample and period are shown for comparison with the cost per degree figures.

Table 2.15 reveals modest differences in cost inflation when degrees rather than enrollment levels are used as a measure of output. In Research, Doctoral, and Comprehensive universities, costs per degree rose faster than costs per full-time-equivalent student. This implies that, over the period 1978–79 to 1985–86, either students at these institutions enrolled for more years before obtaining a degree (see Chapter 5, sec. 5.3, above) or retention rates deteriorated (see Table 5.4 above), or both. At Liberal Arts I, Other-Four-Year colleges, and Two-Year colleges, costs per degree increased more slowly than costs per student. By improving either retention rates or the rate of progress toward degree, Liberal Arts I, Other-Four-Year colleges, and Two-Year colleges contained cost inflation more per degree than per student enrolled. Viewing degrees as a measure of output, the cost inflation problem in higher education looks slightly worse than the picture developed with AE&G expenditures per full-time-equivalent enrollment. The situation at private Liberal Arts I colleges is better (i.e., costs per degree increased at an average annual rate of 4.3 percent vis-à-vis 4.8 percent for costs per student), and the situation at public Comprehensive universities is worse. Retention and time-to-degree problems appear to be most severe at public institutions, especially Comprehensive universities.

12.13 Summary

Expenditures per student for educational services at America's colleges and universities increased 2.7 percent per year faster than the general rate of inflation (as reflected by the GNP implicit price deflator) over the 1980s. The increases were greatest for student services, general administration, and institutionally supported scholarships. Because scholarships are recirculated as tuition income, they do not represent the consumption of real resources with valuable alternative uses. Even excluding scholarships, however, the rate of cost increase per student in American higher education outstripped inflation by 2.6 percent annually from 1978–79 to 1987–88.

Costs increased least for the central functions of a college—instruction (faculty), academic services (including libraries), and plant operations (classrooms). These three categories combined accounted for 2.4 fewer percentage points of adjusted educational and general (AE&G) expenditures in 1987–88 than they did in 1978–79. There was a discernible shift away from instructional expenditures to ancillary and administrative services. Although instructional expenditures declined as a proportion of total costs, they are still the largest single category by a considerable margin and represent an important

source of potential cost savings. We therefore examine this category of costs more closely in chapter 14.

The rate of increase in expenditures per student was three times larger in private institutions than in public colleges and universities. The trend away from the central functions of higher education was also less severe in public institutions. Selective private liberal arts colleges exhibit the most pronounced increases in both costs per student and shifts in budget shares away from instruction, academic services, and plant operations.

In Chapter 13, we compare the increase in cost per student across institutions of different size, looking for economies of scale, and across institutions that experienced different trends in their enrollment, looking for evidence that enrollment shifts affect reported costs per student.