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III Costs and Productivity in American Colleges and Universities

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11 Cost Inflation

Are institutions of higher education increasing tuition charges unnecessarily, unfairly, or, worse, because of incompetence? Is there a bias toward higher costs and so higher charges by institutions of higher education in the United States? Bowen (1980) suggests that costs expand to absorb whatever revenues become available to higher education. Tuition and fees at both public and private institutions increased at an average of over 9 percent per annum from 1980 to 1987, a rate about 4.5 percentage points faster than the consumer price index (CPI) rose over the same period (Hauptman 1990a, p. 4, table 1; see also Table 3.4 above). Even though the experience of the 1970s was quite different, with the average annual rate of increase of tuition lagging the CPI by about 1 percent, tuition increases exceeding advances in the CPI are nothing new. For almost a century, from 1905 through 1989, tuition charges increased an annual rate of 2.5 percentage points in excess of the CPI for three private universities tracked by Bowen (1969) and the College Savings Bank (1989).

Critics conclude that higher education costs got out of control in the 1980s, that university presidents and their faculties are taking a larger share of the national income while producing less, and that high cost is putting college education beyond the financial reach of many low - and, especially, middle-income households.[1] The *Washington Post Weekly* (21–27 August 1989, p. A18) has gone as far as to characterize higher education as a machine with no brakes. Defendants of higher education call attention to declines in federal support, to the overhang of the long-deferred maintenance of buildings and the more rapid obsolescence of increasingly sophisticated equipment, and to the desirability of increasing faculty salaries so as to attract the most able

1. For example, William Bennett, "Our Greedy Colleges," *New York Times*, 18 February 1987, p. A31.

people to the professoriate (e.g., Hauptman 1990a). Others mention the increased expenditures on marketing, student services, and support operations that have become necessary to attract students in this more status-conscious and comfort-demanding era, when the number of people in the prime college-attending population age groups is declining.

Tuition is the price charged to students for higher education. Total expenditures by colleges and universities are much higher than tuition revenues, even at institutions with the highest tuitions. Colleges and universities depend on other sources of revenue as well, including state and federal governments, endowment earnings, philanthropy, and the sale of ancillary services. For all institutions of higher education, tuition and fees combined are less than one-quarter of total revenues. In 1985–86, tuition and fees covered only 36 percent of direct educational expenditures (what we subsequently call adjusted educational and general (AE&G) expenditure, less scholarships from unrestricted university funds) at all colleges and universities in America (Anderson, Carter, and Malizio 1989). From a social perspective, the problem of high cost is larger than the problem of high tuition. Tuition increases alone, however, do *not* imply rampant cost inflation because increases may be caused by shifts in the relative proportion of different revenue sources.

This part of the volume examines the changing patterns of costs at colleges and universities in light of these claims. We do not purport to measure outputs, so our discussion of productivity is tangential. In this chapter, we describe six theories of why college costs surged in the 1980s, and we describe the data we will use in the following chapters to explore these theories. Chapter 12 examines changes in aggregate expenditures, expenditures per student, and expenditures per degree at different types of colleges and universities. Chapter 13 reveals how enrollment growth affects costs and assesses scale economy estimates in higher education. Finally, Chapter 14 decomposes the cost increases of the last decade into changes in the student/faculty ratio, changes in faculty compensation, changes in nonfaculty instructional costs, and changes in the cost of higher education's support functions.

11.1 Why Do College Costs Rise?

The real cost of educational expenditures per student at U.S. colleges and universities rose about 2.7 percent annually from 1978–79 and 1987–88,[2] less than the rate at which real tuition rose, but high enough for concern nevertheless. The increased costs in higher education might be explained in several ways. Six broad points of view reveal the diversity of opinion about rising costs in higher education.

One explanation holds that the market is competitive and that institutions

2. The 2.7 percent per year growth in expenditures per student is calculated from an increase of $1,752 on a 1978–79 base of $6,370 per student (all figures expressed in 1987–88 constant dollars). See Table 12.2.

must therefore meet market tests to survive and prosper. Under these constraints, colleges must provide the range of services that students wish to purchase. Naturally, the level of costs follows from the level of services. Prospective students may be attracted by faculties with stronger reputations, better facilities, a stronger marketing program, and services that improve students' chances of success or that enhance their experience. Where the market for prospective students is strongly competitive, cost increases might reflect product improvements that differentiate a single institution in ways that prospective students find worth the cost, which is passed along accordingly as higher tuition. Colleges, then, must spend more on computers, wider curricula, international programs, and attractive grounds and charge accordingly or risk losing students to institutions who do respond to these student demands. Thus, rising costs of higher education may reflect a change in preferences of students toward a more expensive educational experience with enhanced services. A critical issue is whether institutions of higher education sell their services in workably competitive markets.

A special case of increased costs due to changing student tastes arises from shifts among degree programs. Student interests shifted noticeably in the 1980s. Bowen and Sosa (1989, 47) report that, "between 1970–71 and 1984–85, the number of degrees conferred in the arts and sciences dropped from 40.0 percent of all degrees to 24.9 percent," as students and their parents became concerned about job prospects and the relevance of the arts and sciences. The number of students earning degrees in education also fell substantially. Over the same period, a striking increase occurred in the number of engineering and business degrees awarded.[3]

3. The mix of degrees awarded by American colleges and universities changed substantially in the 1980s. The percentage of total degrees awarded by the institutions in our sample in each of 10 broad categories in 1978–79 and 1985–86 is as follows:

Degree	1978–79 (%)	1985–86 (%)
Two-Year	26.3	26.8
Natural science	6.8	4.6
Social science	10.4	9.6
Humanities	6.8	6.2
Health & allied fields	4.1	3.4
Engineering	4.3	5.1
Business	12.7	17.1
Education	14.8	10.5
Professional (law, medicine, dentistry)	2.1	3.8
Other (including graduate)	11.7	16.2

Source: Authors' calculations based on HEGIS/IPEDS data, (see n. 14 below).
Note: All degrees are four-year except the categories, two-year, professional (which are postbaccalaureate), and other (which includes graduate).

As can be seen from this table, the percentage of degrees awarded in the arts and sciences (the categories natural science, social science, and humanities combined) fell from 24.0 in 1978–79 to 20.4 in 1985–86.

If engineering and business degrees are more costly than arts and sciences and education degrees, the shift in student interests alone can account for some of the rise in the average cost of higher education. In order to evaluate the importance of this explanation of college and university cost inflation in the 1980s, one might identify the relative costs of enrollment in different disciplinary programs and simulate the aggregate cost increase resulting from the actual change in degree mix that occurred over the period, holding constant the costs in each discipline. In view of the shift away from arts and sciences and education toward engineering and business programs, this explanation probably would account for some of the rising aggregate costs. In essence, costs increase because students select more expensive educational programs.[4] Changes in costs due to enrollment shifts would occur in a competitive environment.

A second point of view also considers the market for higher education to be competitive but recognizes that increased prices of inputs faced by all colleges and universities will pass through to consumers in higher charges even if the students see no improvement in the product. For example, a shortage of qualified faculty might increase instructional salaries industry wide. The increased cost of library materials, utilities, and building maintenance would be reflected in total costs and so in tuition charges and claims on legislatures. Again, a critical issue is the degree of competition because it affects the extent to which factor price increases are passed to consumers.

To explore the issue of competition further, consider whether institutions in higher education operate in workably competitive markets. Although institutions differ in character, mix of programs, size, and location, many institutions may operate in market segments that force them to compete for students. For institutions with strong national or regional reputations, the competition may be among institutions at some distance from one another but with a correspondingly large number of competitors. For other institutions, particularly those whose students commute daily from home, the relevant market may be very local, and a given institution may hold a near monopoly on certain services. Yet the next relevant alternative for students may be more hours of employment; hence, these schools may have little ability to increase their tuition without significant loss in enrollment. An important consideration, then,

4. Sufficient data on relative cost differences among disciplines and enrollments (not degrees) by discipline are not available to conduct such a simulation. Furthermore, the effect of changing degree mix alone on the cost inflation of higher education might be overstated by such a stimulation analysis. First, short-run effects of changes in student preferences among disciplines are likely to have relatively little effect, as they will be absorbed as changes in the student/faculty ratio across disciplines. Second, to the extent possible, there will be some substitution of resources (e.g., space, supplies, support staff) from disciplines losing enrollments to those gaining them. Third, the distribution of enrollments across departments is likely to be less responsive to changing preferences than the distribution of degrees since a significant proportion of enrollments in many disciplines consists of "service courses" that form part of general education requirements. Thus, while the changing degree mix probably accounts for some of the cost inflation of the 1980s, it is unlikely to be the sole or even the primary culprit.

is the size of the relevant market for each school and the nature of the programs offered. A critical issue for understanding increased costs is the nature of competition in higher education.

As a third explanation for the rising costs of higher education, the competitive view might be modified if colleges and universities have little opportunity to substitute other inputs for labor in the face of the rising relative cost of their labor inputs. This idea was articulated initially by Baumol and Bowen (1966; Baumol 1967), who applied it first to the live performing arts and then to other service industries. If a certain amount of labor is required to produce higher education, that is to say, if student/faculty ratios are fixed, then, as faculty salaries rise, costs must rise. Productivity gains in the rest of the economy will tend to allow average wage levels to increase with the general price level plus the rate of increase in average productivity. Faculty salaries must increase at the same rate as other wages in the economy if an academic career is to remain attractive. Yet higher education may have smaller gains in productivity if student/faculty ratios are difficult to change. That would be the case if the personal interaction between students and faculty is the product itself, akin to hearing the Boston Symphony perform in Symphony Hall. Therefore, costs and charges in higher education will tend to increase at the same rate as other salaries in the economy and faster than the general price level. At the heart of this argument is the issue of whether there is any prospect of changing the student/faculty ratio and sufficient scope for institutions to adopt innovative methods that increase productivity.[5]

A fourth possible explanation focuses on the central position of faculty and administrators within a college or university. Under the constraints of a not-for-profit organization, it seems plausible to assume that the compensation[6] of those in control, as well as the prestige of being associated with the institution, may play a prominent role among the institution's objectives (Newhouse 1970, 65). The trustees and administration, as well as the faculty, may give considerable weight to the quality of their product as a means to pursue status. Under such circumstances, and with limitations on free entry into the market, institutions are likely to provide greater quality (smaller classes, higher admission standards, greater emphasis on research) than would accommodate consumer tastes in a competitive for-profit market (Newhouse 1970). Al-

5. On the basis of a sample of 37 institutions, Getz and Siegfried (1990) identify and document 30 significant innovations in higher education over the past 50 years. The innovations range from curriculum to finances to student life. It appears that innovations diffuse less rapidly in higher education than in manufacturing. Innovations that use electronic devices seem to diffuse faster than others; innovations involving faculty decision making or that require significant capital outlays seem to diffuse more slowly. The evidence suggests that opportunities exist for institutions of higher education to innovate. Productivity need not remain stagnant. For a positive program to enhance productivity in Research and Doctorate-Granting universities, see Massy (1989).

6. Faculty compensation is not restricted to pecuniary rewards. Job characteristics such as status, control, and hours of work are important to all workers; noncompetitive rents may be extracted through increased status, control over the amount of time faculty spend doing research instead of teaching, the number and distribution of hours worked, and other nonpecuniary means.

though one might argue that management's responsibility is to limit faculty tendencies in this direction, administrators in higher education are frequently drawn from faculty ranks, and many dream that they will eventually return to the classroom. In view of their experience as faculty and their possible return to the ranks, they may act, not as the representatives of trustees or public officials, but rather as agents for the faculty, adopting policies that enhance their salaries, comfort, and status. For institutions where competition is intense, the outcome may be the same as with a competitive process. However, for institutions having succeeded in establishing reputations with distinctive programs and other advantages over rivals, the advantage may be captured by the faculty in the form of increased compensation, improved working conditions, and featherbedding or strategies that promote and display the status of the faculty (e.g., lower teaching loads or a greater emphasis on research). In order for this explanation to bear on the increasing costs of higher education in the 1980s, however, faculty and administrators must either have become more effective in manipulating institutions to their personal advantage or have experienced a change in their preferences, for example, taking greater pride in working at a prestigious institution than they did a decade earlier.[7]

A fifth view of the rising costs of higher education considers the quality of management and decision making in colleges and universities. If institutions do not carefully assess costs and benefits when making decisions, if purchase decisions are not made in a way that induces vendors to give attractive prices, and if rewards are little associated with performance, then indeed costs will be higher without the college's services being more attractive to students or improving faculty welfare. In short, the institution may fail to achieve its goals, whatever they are, at minimum cost. The weak management view is consistent with presidents and other administrators rising through the ranks as successful academics but with limited experience and skill at management. Alternatively, managers imported from outside higher education may fail for lack of experience in higher education. Of course, when an institution is in a competitive market, it will lose students and faculty if management is sufficiently poor. To account for *rising* college and university costs in the 1980s, however, the quality of management must have deteriorated vis-à-vis earlier periods. Critical questions here are the extent to which market forces discipline institutions to perform efficiently and whether institutions have become less adept at attracting and sustaining skilled managers.

A sixth view points to a series of government regulations that create new expectations for higher education. Occupational Safety and Health Administration regulations, Affirmative Action programs, requirement for access and services for the handicapped, requirements for coequal facilities for intercol-

7. On the success of faculty extracting rents from universities, especially at larger, research-oriented institutions, see Hoenack (1983). For an argument that status is an important component in modern consumers' utility functions, see Frank (1985). For arguments that the weight placed on status and "winning" has increased over recent decades, see Frank and Cook (1990).

legiate athletics for females, and increased requirements for cost sharing in many research, training, and other program grants might be cited as examples of regulations that impose cost burdens on institutions, usually without commensurate revenue offsets. Of special note in this view are changing federal government policies with respect to indirect cost recovery rates. Federal grants bear direct costs of the time, equipment, and supplies used by investigators and their research time. However, the direct costs do not include rent for the space, access to library and computing resources, the accounting and oversight functions of the university, and many other functions necessary to operating a research enterprise. Universities have been allowed to aggregate all such costs and to charge an appropriate fraction of such costs as an add-on to grants called "indirect cost recovery." In recent years, however, the federal agencies responsible for reviewing indirect cost recovery rates have sought to lower them even when the cost basis is well established by detailed accounting information. If the allowed indirect cost recovery declines relative to the costs incurred, other sources of revenue, including tuition and appropriations from state legislatures must cover more of the shared costs. Changes in federal programs and in regulations, then, can affect the level and mix of costs on campuses, especially where federal grants are a significant source of revenue. It is worth noting, however, that many of the regulations that affect higher education affect other sectors of our society as well.

In the six explanations of rising costs just given, the rising costs benefit different groups. In the competitive product story, the advantages of higher cost accrue to the students who are simply shopping with their dollars from a long menu for the bundle of services they wish. In the input price story, increasing costs reflect events in input markets beyond the control of higher education. No one in higher education benefits, not even the faculty whose compensation rises (because their opportunity costs rise as well). In Baumol and Bowen's view, higher education is disadvantaged relative to the rest of the economy by its inherently labor-intensive technology of instructors teaching students in groups of relatively fixed size. By contrast, in the management utility maximization view, the faculty and administrators pocket the higher costs as salary and prestige, using market power to impose higher charges on students so they can earn more than they would make in their best alternative employment and enjoy a preferred work environment.[8] In the poor management story, presidents and administrators, students, and faculty all lose through poor decision making. In the government-as-culprit view, congressional and social goals take precedence. These views are not necessarily mutually exclusive, and there may be other explanations as compelling on a priori grounds as some of these (Hauptman 1990a; Kirshstein et al. 1990).

In this study, we present empirical evidence that, in some cases, lends support to some of these explanations and, in other cases, seems inconsistent with

8. Sykes (1988) argues this view forcefully, to the point of exaggeration.

some of them. The study may generate new points of view as well. We hope the result will be a better understanding of the nature of changes in the cost of higher education and, by inference, improved insight into the nature of the institutions. Before we delve into our data, however, we need to address the issue of service quality in higher education, after which we describe the data used in this part of the volume.

11.2 Product Quality and Diversity

Do higher-cost colleges and universities produce better education? If an automobile plant produces superior cars, we may expect those cars to be more costly and to bear higher sticker prices. If consumers buy the more expensive cars when less expensive ones are available, we may conclude that consumers value the additional quality in excess of the cost of the additional resources required to create it and that the automobile plant is more "productive" even though it incurs higher costs per unit. Can the case be made that the quality of output from higher education has increased sufficiently to make the higher-priced product worth the extra cost? Has higher education become more valuable as its costs have risen? Or have costs increased even as the quality of college education has stagnated or, worse, declined?

Quality in higher education is nearly impossible to define (Solmon 1973). One might take the earnings differential between college and high school graduates as an index of the contribution of college education,[9] but growth in the differential can be ascribed to numerous factors other than improved quality in higher education, for example, shifts in the demand for the labor of high school and college graduates or a decline in the quality of secondary education.

It is tempting to conclude that improved knowledge of the various disciplines implies an ever-increasing quality of college education, but such a conclusion may be far from correct. First, it can be argued that the steady flow of new scholarly research does not always improve faculty knowledge. There is a limit to what the human mind can store, process, and understand. Faculty knowledge progresses only if better ideas and improved understanding replace inferior ideas and understanding. Thus, progress depends on the character of competition for ideas and the process by which science and art advance. There is no assurance against temporary setbacks, no guarantee that each discipline moves closer to "truth" each decade.

A more fundamental flaw in the argument that scholarly progress guarantees improved quality in higher education is the implicit premise that the purpose of higher education is to impart "truth" to students. Many would challenge that premise, arguing instead that the primary purpose of a liberal arts

9. For a survey of empirical studies of the value of a college education based on earnings differentials, see Cohn and Geske (1990, 106–10). See also Table 3.2 above.

education is—at the least—to help individuals develop their capacity to think clearly and critically about issues and problems in a variety of ways. If that is the purpose of higher education, scholarly progress among the disciplines in discerning "truth" may have little, if any, effect on the primary output of higher education.

Higher education benefits students through a sequence of events. First, students and their families spend money on tuition, but, more important, they invest their time, time that alternatively they could have devoted to earning income. The forgone earnings of most students are still larger than tuition at all but the most expensive private institutions.[10] Second, the institution provides a set of experiences that transform the students. Among the experiences will be contact with faculty in classes of varying size, association with other students of differing interests, backgrounds, talents, and aspirations, a range of social experiences, and, perhaps, religious, athletic, cultural, political, and other influential experiences. Third, these education experiences have influence throughout the rest of the student's life. The influences may be on career choice, on earnings, on the likelihood of changing careers, on choice of mate, on participation in politics, on health, on enjoyment of the arts, and so on. An assessment of the performance of an institution of higher education would establish the connections between the three links of the chain: student commitment, institutional experiences, and life prospects. Although a few studies have followed a cohort of students through the process and some analysts have drawn inferences from cross-sectional comparisons, all the studies fall short of offering a comprehensive view of the influence of various experiences in higher education on the life prospects of participants (Jacobi, Astin, and Ayala 1987).

Productivity studies of higher education are particularly difficult to conduct. Traditional productivity studies of manufactured products relate output to inputs. Productivity is then judged on the basis of trends over time or on comparisons of the amount of output produced per input unit across producers at a point in time. In most cases output can be measured directly in physical units.

For higher education, on the other hand, there is substantial disagreement about both what output is and what it should be (Pascarelli and Terenzini 1991). One source of the dispute is the practice of funding America's higher education with contributions from various sources. As a result, students, their parents, foundation officials, alumni, government agencies, and taxpayers all believe that they have a role in defining the goals of higher education. Add to

10. Following Table 3.5 above, average nine-month earnings (after taxes and discounted by the probability of unemployment) for a 25- to 34-year-old high school graduate with no college experience in 1987–88 were $12,925 for males and $9,128 for females. Average tuition at private universities was $8,770 in 1987–88. However, some institutions charged much more: tuition and fees at Bennington College, Rensselaer Polytechnic Institute, and Tulane University were $14,850, $11,850, and $11,280, respectively, in 1987–88 (College Entrance Examination Board, *The College Handbook 1987–88* [New York, 1987]).

this faculty and administrators, who argue that their professional judgments are essential to directing the mission of such a complex enterprise as higher education, and considerable conflict occurs about output mix and priorities.

Colleges and universities in America produce a vast array of goods and services. For undergraduates, colleges contribute to cognitive and affective development, sorting and screening, helping individuals develop a sense of responsibility and self-esteem, social development, citizenship, and even entertainment (e.g., on Saturday afternoon in the university football stadium). A large fraction of our universities are also heavily involved in graduate and postbaccalaureate professional education and research, the products of which include future lawyers, physicians, business leaders, and faculty—and new ideas. Many of our colleges and universities also provide public services, such as the agricultural extension and experimentation services of land-grant universities or the job retraining assistance provided by many two-year colleges.

The problems of measuring the productivity of colleges and universities, however, go beyond multiple outputs valued differently by different constituents.[11] By its very nature, the output of higher education includes substantial intangible elements that are not traded in markets. Few would argue that the sole purpose of higher education is to enhance the subsequent earnings of students. But how is one to measure the benefits of self-discovery, socialization, maturation, and improved reasoning and judgment beyond their effects on labor market achievement? How is one to measure the value of friendships and memories? In short, so many of the services of higher education cannot be measured in physical units and escape formal valuation in markets that there is little prospect ever to pin down even a rough approximation of their value.

The problems go even further than multiple, intangible, and unpriced outputs. Productivity analysis in higher education faces additional measurement problems because many of the outputs are jointly produced with inputs that are not hired by the institutions, for example, students' intrinsic talents, and because the production process for learning is so poorly understood and varies so much across individuals. Furthermore, output includes both consumption and investment components, and many people consider the process itself to be an essential component of output.

A great deal of what individuals gain from a college experience may, in fact, be impossible to measure. Many years ago, James A. Garfield spoke of the ideal college as a log with Mark Hopkins on one end and a student on the other.[12] We may suppose that Hopkins imparted a set of skills that might be

11. Multiple outputs can be related to multiple inputs with sophisticated econometric techniques. For illustrations of this practice applied to higher education, see Cohn, Rhine, and Santos (1989) and de Groot, McMahan, and Volkwein (1989).

12. Garfield articulated this view of college during a speech at his alma mater, Williams College, before he was inaugurated as the twentieth president of the United States. At the time of the speech, Hopkins was president of Williams College.

measured directly. But we may also suppose that Hopkins responded to student puzzles, instilled a spirit of responsibility, nurtured intellectual curiosity, and offered a measure of inspiration that could not be measured directly. We expect the professor to appeal differently to different students; some need context, some need discipline, some need courage. We expect students to respond differently: some value the poetry, some the logic, and some the power of the same idea. We can imagine a student of accounting learning in one setting that the debits are on the window side of the ledger, in another why firms may (honestly) keep three sets of books (one for the shareholders, one for the tax collector, and one for the managers), and in a third why accountants seldom become chief executive officers of large corporations. Higher education may be as important in socialization, matching interest to opportunity, and developing a coherent worldview as in developing specific skills. Social science needs more powerful tools if it is to offer insight into the full breadth of influence of higher education on those who invest in it.

Finally, higher education may affect our society on a scale far beyond the consequences measured for each individual student. Colleges and universities produce ideas expressed in books, music, art, patents, and medical, managerial, and legal techniques. Professors advise senators and presidents, often creating and interpreting the vocabulary by which the public debates the issues of the day. The full consequences of having a literate and cultured society may not be measured even approximately by the experiences of individuals taken one at a time. Measuring such purely social consequences of higher education is beyond available techniques.

Realistic estimates of educational production functions have been limited by the obstacles outlined above (Schapiro 1987; Gilmore 1988). Because the task of measuring outcomes is so difficult (some argue impossible), our focus here is on inputs and costs rather than results. Any insight about outcomes and productivity offered here comes indirectly and cautiously. Even if we are unable to measure and value outcomes, however, if they have remained about the same over the past decade, we can still learn something from changes in costs over the period.[13]

11.3 Higher Education in the 1980s

It is useful to begin our analysis of costs with a review of the institutions constituting higher education in the United States in the 1980s. Institutions

13. The difficulties measuring outputs and assigning inputs to these outputs may make productivity analysis in higher education difficult, but they do not make it impossible. In a study conceived out of the project that led to this book, Getz and Siegfried (1990) look at productivity in higher education in terms of the rate at which ultimately successful innovations diffuse through educational institutions. By restricting the analysis to "successful" innovations, the speed with which colleges and universities adopt new ideas can be used to measure their "productivity" because the failure to adopt improvements promptly forces society to incur unnecessary opportunity costs. Characteristics of institutions that appear to be leaders in innovation can then be identified.

Table 11.1 **Sample Institutions Compared with Population**

	(1) No. of Institutions per Carnegie Foundation, 1987	(2) No. of Institutions in Our Sample, 1978–79 to 1987–88	(3) Coverage [(2)/(1)] × 100 (in %)
Research	104	90	86.5
Doctoral	109	96	88.1
Comprehensive	595	522	87.7
Liberal Arts I	142	131	92.2
Other-Four-Year[a]	430	353	82.1
Two-Year	1,367	853	62.4
Specialized	642	0	.0
Total	3,389	2,045	60.3

Sources: Carnegie Foundation for the Advancement of Teaching (1987, table 2); and U.S. Department of Education HEGIS/IPEDS data for 1978–79, 1983–84, 1985–86, and 1987–88.

[a]Called "Liberal Arts II" by the Carnegie Foundation.

are a proper focus of the analysis of costs because in most cases the critical decisions are made by officials of individual institutions. Moreover, the Department of Education collects data about institutions, and so analysis of institutional behavior with a broad sample is possible. The few studies of costs at the department level have almost always looked at a single institution or a small group of institutions (Hoenack et al. 1986; Tierney 1980a; Brovender 1974; Razin and Campbell 1972; Borgman and Bartram 1969; Gibson 1968; Buckles 1978), thus limiting the extent to which their findings can be generalized.

There are about 3,400 institutions of higher education in the United States offering at least a two-year associate or four-year degree program, as shown in Table 11.1. At least two hundred of these were founded during the 1980s, more than the total number of colleges existing in America in 1850 (Harris 1972, table 5.2–1, p. 924). The institutions serve diverse missions; well over one-third of them offer only two-year programs, and about one-fifth offer four-year programs exclusively. Approximately one-third of the institutions offer postbaccalaureate programs in addition to undergraduate programs, and about one-fifth have programs confined to specialties such as freestanding medical or law schools. Over 400 institutions award doctoral degrees. Other institutions engage in postsecondary training programs that are not generally viewed as part of higher education; most important among these are the proprietary vocational schools. These usually offer vocational training (e.g., data processing, cosmetology, truck driving).

Our analysis relies on the HEGIS/IPEDS[14] survey of institutions of higher education undertaken annually by the U.S. Department of Education. We use

14. The annual "census" of colleges and universities was called the Higher Education General Information Survey (HEGIS) through 1985–86. At that time, the survey was revised and expanded and its name changed to the Integrated Postsecondary Education Data System (IPEDS).

survey data from 1978–79, 1983–84, 1985–86, and 1987–88 to examine the finances and enrollments of 2,045 institutions over time.[15] Our sample includes over 80 percent of the institutions identified by the Carnegie Foundation in all categories except the Two-Year group, where our coverage is slightly over 60 percent, and specialized institutions, which we exclude entirely (see Table 11.1)[16] Eight-six percent of the colleges and universities that award a bachelor's degree are included in our data base. In the remainder of this part of the volume, we draw conclusions from the sample of 2,045 as though it were all of higher education.[17] For expositional convenience, we will occasionally refer to the period 1978–79 to 1987–88 as though it were coterminous with the decade of the 1980s.

The HEGIS/IPEDS responses are unaudited. When an institution's own accounting system uses categories that are incongruent with the HEGIS/IPEDS categories, the institution may make arbitrary choices in deciding on a response. The institution may make one choice in one year and respond differently in a subsequent year. The Department of Education, which collects the survey, does not verify the information, test for consistency from one year to the next, or require that the information be complete. We have excluded from our statistics institutions with wildly implausible figures by checking for certain kinds of internal consistency. We do not provide independent verification of the data. *Caveat lector.*

The flagship state universities, leading private universities, and other doc-

15. Our sample consists of 2,045 colleges and universities that operated continuously in the United States from 1978–79 to 1987–88. We omitted specialized institutions (e.g., freestanding medical and law schools) and any other schools that did not have any full-time undergraduate students. Only institutions reporting at least some expenditures for instruction, student services (e.g., admissions, registrar), institutional support (president, provost), and plant operations (maintenance, utilities) are included. In short, a college is a college in our view only if it reports spending at least one dollar on each of these four fundamental services; a few dozen institutions were eliminated on the basis of this criterion. Reports of zero expenditures for sponsored research, public service, and unrestricted scholarships appear for some institutions that surely have such expenditures. We concluded that those institutions reported such expenditures in other accounts. If the reporting appears consistent (e.g., a category was zero for all four years), we accepted it, understanding that some of the expenditures in other categories are for research, public service, and/or scholarship purposes. If the reporting standard appears inconsistent (e.g., Columbia University's public service expenditures increased from zero in 1984 to $126,000,000 in 1988), we assumed that there had been a change in accounting practice that would invalidate comparisons over time, and the institution was deleted from our sample. We also eliminated five colleges that reported implausible enrollment fluctuations, probably caused by data-processing errors. Reported library expenditure data for many institutions on the IPEDS 1987–88 data tape are implausible (e.g., we do not believe that Harvard spent nothing on its 50 libraries in 1988). Because library expenditures are included in academic support, we do not report library expenditures separately.

16. For a description of each Carnegie classification, see Table 2 of the introduction to this volume.

17. Based on enrollment shares reported in Table 2 of the introduction to this volume and coverage ratios reported in Table 11.1, we estimate that our sample includes 68.5 percent of total enrollments and 87.2 percent of enrollments at four-year undergraduate colleges in 1987–88. The largest share of total enrollments missing from the sample is two-year colleges (22.9 percent). We exclude specialized institutions, which account for only 3.8 percent of total enrollments. Thus, only 4.8 percent of the enrollments missing from our survey come from four-year institutions.

Table 11.2 **Sample Institutions and Enrollment by Carnegie Classification**

Carnegie Classification	No. of Institutions	% of Instititutions	No. of FTE Students[a]	% of FTE Students
Research	90	4.4	1,660,920	23.2
Doctoral	96	4.7	895,051	12.5
Comprehensive	522	25.5	2,174,478	30.4
Liberal Arts I	131	6.4	185,754	2.6
Other-Four-Year	353	17.3	265,190	3.7
Two-Year	853	41.7	1,975,801	27.6
Total	2,045	100.0	7,157,194	100.0

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

[a]Full-time-equivalent (FTE) students = full-time students + ⅓ part-time students averaged over 1978–79, 1983–84, 1985–86, and 1987–88.

toral institutions that the Carnegie Foundation labels "Research" and "Doctoral" constitute fewer than 10 percent of the institutions of higher education but account for 36 percent of the total enrollment in full-time equivalents, as shown in Table 11.2.[18] They dominate graduate education, public service, research, big-time college athletics,and name recognition by the general public; these are the conglomerates of higher education. Conversely, the smaller institutions in the Liberal Arts I and Other-Four-Year categories account for 24 percent of institutions in our sample, but only 6 percent of enrollment.

The Research and Doctoral institutions have a special importance because their graduate programs produce future professors for all of higher education and their research efforts are an integral part of basic research in America. The Liberal Arts I schools graduate a disproportionate share of the baccalaureates who later become professors[19] and a large fraction of our country's cultural, political, and business leaders. There is something of a pecking order of influence and prestige, with Research universities training faculty for most of the other sectors. Yet the Comprehensive institutions and the Two-Year colleges together enroll more than half of all students. All the institutions play different roles and therefore have different characteristics, which are reflected as much in their finances as in their catalogs.

The great importance of the private sector in higher education in the United States is unique in the world. Private colleges and universities account for 41 percent of the institutions of higher education, as shown in Table 11.3. The private institutions ("privates," for short) in every Carnegie classification are smaller than the public institutions ("publics"), and so the privates account for

18. Following the convention of others (e.g., Bowen and Sosa, 1989, 32), we define full-time-equivalent enrollment as full-time plus one-third part-time enrollment.

19. Although a high proportion of the baccalaureate graduates of Liberal Arts I colleges have traditionally continued their education to earn a Ph.D. in economics, this fraction appears to have declined in the 1980s (Kasper 1990a).

Table 11.3 Sample Institutions and Enrollment by Institutional Control

Control	No. of Institutions	% of Institutions	No. of FTE Students[a]	% of FTE Students
Public	1,203	58.8	5,643,032	78.8
Private	842	41.2	1,514,162	21.2
Total	2,045	100.0	7,157,194	100.0

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

[a]Full-time-equivalent (FTE) students = full-time students + ⅓ part-time students averaged over 1978–79, 1983–84, 1985–86, and 1987–88.

only 21 percent of enrollment. Private institutions are somewhat more important in graduate education than undergraduate, they are much less important in Two-Year education than four-year, and they wholly dominate the Liberal Arts I and Other-Four-Year categories. The private sector includes many schools with a strong religious emphasis or with ethnic identifications. About 100 private institutions have endowments that are large enough to be important in the financial life of the schools.[20] The philanthropic tradition in America sustains many of the private schools with current giving as well as in periodic capital campaigns.[21]

Private colleges and universities charge tuitions that are many multiples of tuitions in the public sector, yet, in the aggregate, they continue to thrive. The privates must offer services that students find worth the price difference. As we will see, the privates do not, on average, pay their faculties more than public institutions. They have pursued a variety of strategies to distinguish themselves, including different student/faculty ratios, a religious emphasis, and distinctive social milieus. That privates are, on average, much smaller than their public competitors should not be accepted as coincidental. The smaller scale may well be critical in providing a distinctive experience that some students value highly.

Public higher education is primarily a responsibility of the several states, education not having been mentioned in the federal constitution. Each state operates one or more systems of higher education, often with grand research university campuses as centerpieces flanked by regional comprehensive universities (many of whom had former lives as teacher-training academies).

20. For fiscal year 1986, Harvard reported the largest endowment, $3.4 billion; Colorado College was ranked 100 among the 3,400 colleges and universities, with an endowment of $87.5 million. The largest 100 endowments accounted for 72 percent of the endowments of all colleges and univerisites (U.S. Department of Education 1988, table 148, p. 282). Endowment income constitutes less than 3 percent of revenues of all colleges and universities combined. It is relatively more important at private institutions, where it accounted for 5 percent of revenues in 1985–86 (Anderson, Carter, and Malizio 1989, tables 95, and 97).

21. Endowment income plus private gifts, grants, and contracts accounted for about 15 percent of the revenues of private colleges and universities in 1985–86 (Anderson, Carter, and Malizio 1989, table 97).

These are complemented by an array of Two-Year colleges that offer terminal vocational programs or specialized professional training (e.g., dental hygiene, mortuary science) or serve as the lower division (i.e., freshman- and sophomore-level programs) of the state university system (e.g., the Pennsylvania State University has numerous two-year campuses that feed its University Park campus).

The national government began support for higher education with the Morrill Act during the Lincoln administration, awarding grants of land to universities in each state for promoting agriculture and industry. The federal government continues to support university-based agricultural research, education, and extension programs. Early in this century, the federal government began to support university-based medical research, with funding awarded on a competitive basis for specific projects. This model was adapted for the support of scientific research as the Cold War induced the federal government to sponsor defense-related research in the 1950s. Recently, the agricultural community has called for moving its federal support programs toward the competitive project grant regime as a way of improving quality and productivity (National Research Council 1989c). In the 1960s, the federal government added support to higher education through grants and loans to students. To a degree, aid flows to students and allows them to shop for what they perceive to be the "best values" in higher education (Hansen and Weisbrod 1971). The national government directly supports its five service academies and a few institutions in the District of Columbia. There is no national university.

The financing of private and public colleges and universities differs substantially. In Chapter 12 we show that, on average, private institutions (without a medical school) spent about $3,400 more per full-time-equivalent student than did comparable public universities in 1987–88. In the same year, however, the difference in tuition between them was closer to $5,700 (see Table 3.4 above). Although students at public institutions do not enjoy the same level of expenditures as those at the privates, they receive a price discount that more than compensates for the lower level of spending. The difference, of course, is covered by direct appropriations from (mostly) state governments. In essence, *all* students at public institutions receive a partial scholarship roughly equivalent to the difference between their tuition and expenditures per student at their school.

Students at the same institution also often make different contributions to revenues, reflecting differences in scholarship awards. The variation is greater at private than at public schools. According to the sample used in this part of the volume, the sum of external and institutionally supported scholarship aid per student averaged $533 at publics and $1,769 at privates in 1987–88. Thus, the average *net* tuition difference between privates and publics was about $4,500 in 1987–88. The average tuition level, however, means less at private than at public colleges and universities because scholarship aid is distributed

much less uniformly across students than is state aid at public universities. At private institutions, many students pay the "sticker price," while others receive scholarships based on need, academic or athletic merit, or other criteria. In short, public universities in America are similar to discount stores, offering "everyday low prices" to their customers, while private colleges and universities are like full-service stores, competing on the basis of service and carefully distributed discount coupons (which they call financial aid).

Federal grants to support research and development are an important source of revenue for Research and Doctoral institutions, and the research activities of colleges and universities account for a significant proportion of the total research and development produced in the United States. Total federal obligations to universities and colleges for research and development summed to $6.5 billion in 1986.[22] The 100 institutions earning the largest amounts received 85 percent ($5.6 billion) of the total. Johns Hopkins University received the largest amount at $446 million, Yale was tenth with $112 million, and Georgetown University was one hundredth with $15 million.[23] Research funds are consequential to research universities.

The National Science Foundation reports the total national expenditure on research and development in 1986 at $51.4 billion, of which colleges and universities received or managed $9 billion (about 17 percent) when federally funded research-and-development centers are added to grants.[24] Federal intramural research facilities and industrial labs account for most of the rest. Note that the National Science Foundation survey omits university-based investigation that is not sponsored by external funds. In basic research, the role of colleges and universities is even more important. Higher education spent or managed $4.8 billion of the $8.1 billion the nation spent on basic research in 1986. The three agencies accounting for the largest amounts of research-and-development funds to universities and colleges are as follows: Health and Human Services, $3.3 billion (58 percent of the agency's total R&D effort); Defense, $1.1 billion (3 percent of the agency's R&D effort); and the National Science Foundation, $0.9 billion (73 percent of the agency's R&D effort). The research productivity of the nation depends critically on the activities of colleges and universities.

22. National Science Foundation, *Federal Support to Universities, Colleges, and Selected Nonprofit Institutions, Fiscal Year 1986* (Washington, D.C.: U.S. Government Printing Office, 1986), table B-5, p. 15.

23. Many of the research grants are awarded by competition. For example, the *National Science Foundation Annual Report, 1988* ([Washington,D.C.: U.S. Government Printing Office, 1988], inside cover) reports that the NSF received 37,500 proposals and awarded more than 16,000 grants in 1988. A telephone call revealed that the National Institutes of Health received 20,080 proposals in fiscal year 1990 and funded 4,845.

24. National Science Foundation, *Federal Funds for Research and Development, Fiscal Years 1986, 1987, and 1988* (Washington, D.C.: U.S. Government Printing Office, 1988), vol. 36, tables C-1, p. 16, and C-7, pp. 28–29.

Table 11.4 **Sample Institutions and Enrollment by Size Class**

Enrollment Size Class[a]	No. of Institutions	% of Institutions	No. of FTE Students[b]	% of FTE Students
0–999	635	31.1	398,083	5.6
1,000–2,999	750	36.7	1,310,661	18.3
3,000–9,999	500	24.4	2,721,851	38.0
10,000–19,000	119	5.8	1,635,688	22.9
20,000+	41	2.0	1,090,911	15.2
Total	2,045	100.0	7,157,194	100.0

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

[a]Based on average number of full-time-equivalent students in 1978–79, 1983–84, 1985–86, and 1987–88.

[b]Full-time-equivalent (FTE) students = full-time students + ⅓ part-time students averaged over 1978–79, 1983–84, 1985–86, and 1987–88.

Institutions differ widely in size, as reported in Table 11.4. More than two-thirds of our colleges have enrollments of under 3,000. Many of these small colleges are in rural areas, conveniently located for commuting students. Some of the small schools limit enrollment by design. They are small enough for the president to know each faculty member by name, if not each student. Some institutions are small because their enrollments have declined as their programs have lost favor. We will be interested in observing whether costs differ systematically with size. Can larger institutions offer education at lower cost per student than smaller ones? We will turn to the financial data in Chapter 13 with this question among others.

Enrollments grew over the 1980s, and they grew in almost every subcategory, both full- and part-time at both four- and two-year schools and at both graduate and undergraduate levels, as shown in Table 11.5. This growth occurred despite unfavorable demographic trends. The size of the birth cohort peaked in 1962. Eighteen years later, the number of 18-year-olds reached a peak, so the pool of candidates in the prime age bracket for higher education started its slide at the beginning of the decade. For a time, the shrinking college age cohort did not affect enrollment levels, owing mainly to an increase in the enrollment rate of 18- to 24-year-olds and increased enrollment of older students, as the baby-boom cohort moved above age 30. At the beginning of the 1990s, however, it appears that college enrollments will finally begin to decline, and projections are that they may decline until at least 1995 (Bowen and Sosa 1989, 37).

Both the public and the private sectors gained enrollment during the 1980s, as shown in Table 11.6. Graduate education became somewhat more important for the private sector but became a slightly smaller share of the public sector. Part-time students are especially important at public Two-Year col-

Table 11.5 **Enrollment Trends in American Colleges and Universities, 1978–79 to 1987–88**

	1978–79	1983–84	1985–86	1987–88	Annual Rate of Change
Four-year institutions (N = 1,192):					
Full-time enrollment	4,341,522	4,593,297	4,553,614	4,655,940	.7
Part-time enrollment	1,801,380	1,935,139	1,955,227	2,051,850	1.4
Full-time undergraduate	3,995,998	4,232,819	4,181,844	4,279,523	.7
Part-time undergraduate	1,228,668	1,378,310	1,391,353	1,454,502	1.8
Full-time graduate	345,524	360,478	371,770	385,417	1.2
Part-time graduate	572,712	556,829	563,874	597,348	.3
Two-Year institutions (N = 853):					
Full-time enrollment	1,215,934	1,346,643	1,226,788	1,251,164	.2
Part-time enrollment	1,907,809	2,205,820	2,156,162	2,318,237	2.0
Full-time undergraduate	1,215,836	1,346,541	1,226,661	1,251,080	.2
Part-time undergraduate	1,906,933	2,205,316	2,155,379	2,317,727	2.0
Full-time graduate	98	102	127	84	−.3
Part-time graduate	876	504	783	510	−4.6

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

leges, and their importance grew throughout the 1980s. Interestingly, the private Two-Year colleges attract part-time students at about the same rate as private four-year schools. In this respect, as in quite a number of others, the private Two-Year colleges are more like private four-year colleges than they are like public Two-Year colleges.

Table 11.7 reports enrollment data by Carnegie classification. Research institutions and Liberal Arts I colleges grew somewhat more slowly than Doctoral and Comprehensive institutions, perhaps by design and perhaps in response to the accelerating tuition levels of Research and Liberal Arts I institutions in the 1980s. Many institutions consciously limit enrollments so as to retain the human attributes of a particular scale of operation. By restricting enrollment, institutions can limit admission to particular students. The selective schools can then offer the promise of a certain exclusivity to future students. If the attitudes, skills, and motivation of peers is an important ingre-

Table 11.6 **Full-Time-Equivalent Enrollment Trends in American Colleges and Universities, 1978–1979 to 1987–88, by Control**

Control	1978–79	1983–84	1985–86	1987–88	Annual Rate of Change
Four-year institutions (N = 1192):					
Public (N = 453):					
FTE enrollment	3,541,469	3,768,440	3,740,166	3,846,166	.9
Average FTE enrollment	7,818	8,319	8,256	8,491	
% part-time	29.5	29.2	29.9	30.6	
% graduate	14.5	13.2	13.5	13.7	
Private (N = 739):					
FTE enrollment	1,400,513	1,469,903	1,465,191	1,493,497	.7
Average FTE enrollment	1,895	1,989	1,983	2,021	
% part-time	29.0	30.8	30.5	30.5	
% graduate	16.2	16.1	16.7	17.2	
Two-Year institutions (N = 853):					
Public (N = 750):					
FTE enrollment	1,800,058	2,020,908	1,887,864	1,966,827	.9
Average FTE enrollment	2,400	2,695	2,517	2,622	
% part-time	61.8	62.8	64.4	65.6	
% graduate	.0	.0	.0	.0	
Private (N = 103):					
FTE enrollment	51,812	61,008	57,644	57,082	1.1
Average FTE enrollment	503	592	560	554	
% part-time	22.3	30.8	32.0	32.0	
% graduate	.0	.0	.0	.0	

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

[a]Full-time-equivalent (FTE) students = full-time students + ⅓ part-time students.

dient in the educational process, or if the screening accomplished by the admissions process is relied on by employers and graduate and professional schools, then the fact of selection may increase the attractiveness of the school to subsequent students. We have kept the number of schools and their classification by mission unchanged over the interval of study (they are all classified on the basis of their 1987 Carnegie classification) so that the reported enrollment and financial figures are not affected by possible changes in mission or entrances and exits of institutions. Although some institutions may be misclassified (Breneman 1990), each category represents a consistent set of institutions.

Institutions of all size groups experienced growth, but, on average, smaller institutions grew slightly faster than larger institutions, as Table 11.8 reveals. Among Two-Year colleges, the schools with fewer than 3,000 students grew

Table 11.7 **Enrollment Trends in American Colleges and Universities by Type of Institution, 1978–79 to 1987–88**

	1978–79	1983–84	1985–86	1987–88	Annual Rate of Change
Research institutions (N = 90):					
FTE enrollment	1,595,578	1,671,114	1,671,630	1,705,360	.7
Average FTE enrollment	17,729	18,568	18,574	18,948	
% part-time	22.6	22.9	22.8	23.5	
% graduate	20.5	19.8	20.3	20.7	
Doctoral institutions (N = 96):					
FTE enrollment	854,653	907,456	898,783	919,312	.8
Average FTE enrollment	8,903	9,453	9,362	9,576	
% part-time	32.0	32.3	32.4	32.8	
% graduate	17.9	16.7	17.0	17.4	
Comprehensive institutions (N = 522):					
FTE enrollment	2,049,591	2,211,077	2,188,874	2,248,369	1.0
Average FTE enrollment	3,926	4,236	4,193	4,307	
% part-time	35.2	34.9	35.8	36.2	
% graduate	12.1	11.0	11.1	11.3	
Liberal Arts I institutions (N = 131):					
FTE enrollment	182,627	184,869	185,385	190,133	.4
Average FTE enrollment	1,394	1,411	1,415	1,451	
% part-time	12.8	12.9	12.1	12.2	
% graduate	3.4	3.6	4.0	4.0	
Other-Four-Year institutions (N = 353):					
FTE enrollment	259,533	263,828	260,684	276,716	.5
Average FTE enrollment	735	747	738	784	
% part-time	20.1	24.6	26.1	27.7	
% graduate	26.3	31.1	38.9	45.2	
Two-Year institutions (N = 853):					
FTE enrollment	1,851,870	2,081,916	1,945,509	2,023,910	.9
Average FTE enrollment	2,171	2,441	2,281	2,373	
% part-time	61.1	70.6	63.7	64.9	
% graduate	.0	.0	.0	.0	

Source: Calculations by authors based on HEGIS/IPEDS data.
Note: FTE = full-time-equivalent.

twice as fast as the schools with 3,000 or more students. Among four-year institutions, growth appears to be concentrated in medium-sized schools. Those with enrollments under 1,000 and over 20,000 grew at about half the rate of schools with enrollments between 1,000 and 20,000. These patterns reflect the enrollment targets set by selective schools and the investments in campuses made by state systems, but probably are dominated by the selection of schools by prospective students.

Full-time-equivalent enrollments have grown at slightly less than 1 percent annually from 1978–79 to 1987–88. But growth has not been uniform at all

Table 11.8 **Full-Time-Equivalent Enrollment Trends in American Colleges and Universities, 1978–1987, by Size Class**

Average Enrollment	Sample Size	1978–79	1983–84	1985–86	1987–88	Average Annual Rate of Change
Four-year institutions:						
0–999	333	208,000	212,724	209,544	221,009	.5
1,000–2,999	412	687,599	727,980	727,954	755,131	1.0
3,000–9,999	303	1,613,668	1,739,820	1,715,915	1,745,711	.9
10,000–19,999	103	1,377,774	1,460,463	1,453,308	1,505,327	.9
20,000+	41	1,054,941	1,097,356	1,098,636	1,112,713	.6
Total	1,192	4,941,982	5,238,343	5,205,357	5,339,891	
Two-Year institutions:						
0–999	302	171,706	190,713	184,279	194,357	1.3
1,000–2,999	338	536,253	623,402	577,976	606,349	1.2
3,000–9,999	197	976,157	1,070,396	1,000,191	1,034,546	.5
10,000–19,999	16	176,754	197,405	183,062	188,658	.6
Total	853	1,860,870	2,081,916	1,945,508	2,023,910	

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

institutions. One-third of our sample institutions experienced growth rates exceeding 1.8 percent annually over the period, while enrollments at about another third (36.5 percent) actually declined. The different enrollment experiences of various categories of institutions are reported in Tables 11.9 and 11.10.

Because the public sector has grown slightly faster than the private sector over the decade, it is no surprise to find that public Comprehensive and public Two-Year colleges contain the highest proportion of institutions whose enrollments grew in excess of 1.8 percent annually. Of the institutions with declining enrollments, a disproportionate share are private Other-Four-Year (less selective liberal arts and smaller comprehensives) and Two-Year colleges. Both these categories appear to contain institutions in the midst of transition. Over 78 percent of the institutions in each category are experiencing either rapidly rising or declining enrollments. Both categories contain mostly institutions that enroll under 1,000 students (267 of 330 private Other-Four-Year and 93 of 103 private Two-Year), and the two categories together account for 57 percent of the 635 institutions in our sample with fewer than 1,000 students. This, and further evidence we uncover later, suggests that such small institutions are not in stable equilibrium. Most of these institutions will either grow to enrollment levels beyond 1,000 or eventually close their doors.

With this description of the environment of American higher education in the 1980s, we turn in subsequent chapters to an analysis of the patterns and trends in costs. In Chapter 12, we look at how cost structures and changes in costs over time are related to institutional mission and control. In Chapter 13,

Table 11.9 **Distribution of Institutions with Fastest-Growing Enrollments[a] (percentage among top third enrollment growth, 1978–79 to 1987–88)**

	Public			Private			Total		
Carnegie Classification	Sample Size	No. Growing	% Growing	Sample Size	No. Growing	% Growing	Sample Size	No. Growing	% Growing
Research	66	8	12.1	24	3	12.5	90	11	12.2
Doctoral	60	14	23.3	36	8	22.2	96	22	22.9
Comprehensive	301	114	37.9	219	72	32.9	520	186	35.8
Liberal Arts I	2	1	50.0	129	16	12.4	131	17	13.0
Other-Four-Year	22	9	40.9	331	105	31.7	353	114	32.3
Two-Year	750	296	39.5	103	36	35.0	853	332	38.9
Total	1,203	442	36.7	842	240	28.2	2,045	682	33.3

Source: Computations by authors based on HEGIS/IPEDS data for 1978–79, 1983–84, 1985–86, and 1987–88.

[a]The lowest annual rate of enrollment growth 1978–79 to 1987–88 among the fastest-growing one-third of institutions is 1.8 percent.

Table 11.10 **Distribution of Institutions with Fastest-Declining Enrollments[a] (percentage among lowest third enrollment growth, 1978–79 to 1987–88)**

	Public			Private			Total		
Carnegie Classification	Sample Size	No. Declining	% Declining	Sample Size	No. Declining	% Declining	Sample Size	No. Declining	% Declining
Research	66	17	25.8	24	0	0.0	90	17	18.9
Doctoral	60	11	18.3	36	13	36.1	96	24	25.0
Comprehensive	301	79	26.1	219	71	32.4	520	150	28.8
Liberal Arts I	2	1	50.0	129	38	29.5	131	39	29.8
Other-Four-Year	22	6	27.3	331	154	46.5	353	160	45.3
Two-Year	750	243	32.4	103	49	47.6	853	292	34.2
Total	1,203	357	29.7	842	325	38.6	2,045	682	33.3

Source: Computations by authors based on HEGIS/IPEDS data for 1978–79, 1983–84, 1985–86, and 1987–88.

[a]The highest annual rate of enrollment growth 1978–79 to 1987–88 among the slowest-growing third of institutions is −0.1 percent. Of the 2,045 institutions in the sample, 747 experienced declining enrollments.

we look more closely at the effect of growth and decline on per-student expenditures and examine how per-student costs vary with the size of an institution. Finally, in Chapter 14, we investigate the link between the student/faculty ratio and the cost per student in an effort to learn precisely what is driving up college costs. Our goal throughout is to see what we can learn about recent developments in the costs of higher education that might shed light on the different theories of why tuition has increased so rapidly.