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Volume Author/Editor: Charles T. Clotfelter, Ronald G. Ehrenberg, Malcolm Getz, and John J. Siegfried

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Chapter Author: Charles T. Clotfelter

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I Demand for Undergraduate Education

Charles T. Clotfelter

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1 Size and Significance

Among the major functions of higher education, none touches more people directly than undergraduate education. By the late 1980s, there were more than 11 million undergraduate students in U.S. colleges and universities, and over one-fifth of the population between the ages of 25 and 29 had completed at least four years of college. Although the effects of college training are still not well understood, there is strong evidence that college training affects not only the potential economic productivity of graduates but also personal attitudes and values (see, e.g., Hansen 1970; and Solmon and Taubman 1973). The demand for undergraduate education raises important issues at two levels, issues related to the aggregate level of college enrollment and to its composition (particularly by racial and socioeconomic group).

At the aggregate level, the demand for higher education is important most obviously to the higher education industry itself since enrollments are a principal determinant of total revenues available to colleges and universities. But this demand has much broader significance, in part because of the scale of the enterprise and the extent of the economic resources that it represents. A major portion of the economic cost of undergraduate training takes the form of productive work that students would have been engaged in had they not been enrolled, measured roughly by their forgone earnings while in college. To the extent that college training does increase productivity, there are obviously important economic implications of the demand for college places, for both individuals and society. This issue has taken on a significance in recent years reminiscent of the post-Sputnik period, as debate has increasingly focused on the ability of the nation's education system to prepare young workers for technical positions in industries facing stiff international competition.[1] From the

1. Newman's (1985) book is a good example of this line of argument. Projections of labor requirements such as those periodically published by the Department of Labor also indicate a growing need for college-trained labor. See, e.g., "Demand for College-Educated Workers May Outstrip Supply in 1990's," *Chronicle of Higher Education*, 3 January 1990, p. A2.

standpoint of public policy, perhaps the biggest question concerning aggregate demand is whether the size of college enrollment is socially optimal or whether it needs to be increased by way of government subsidy. Some observers believe that the benefits of higher education go beyond those enjoyed by the students themselves and that such external benefits constitute an important justification for public subsidies (see, e.g., Nerlove 1972). This view would lend support both to government-financed student aid programs and to the low-tuition policies of most state higher education systems. Others believe, however, that most of the benefits of higher education accrue to the students themselves, thus weakening the case for across-the-board subsidies.[2]

Not only is the size of enrollments important, but so is their economic and demographic composition. Because of the strong association between college training and lifetime earnings, the distribution of college training is closely linked to the distribution of income. Whether this strong association arises because college training makes students more productive or merely because a college degree is a recognizable and lucrative credential, college remains an extremely important avenue for the attainment of status and wealth.[3] Despite an increase in college participation among traditionally underrepresented groups, there continues to be concern that a large share of the benefits of higher education goes to a relatively small group of students (Newman 1985, 24). In particular, attention has been focused on the comparatively low college enrollment rates of minority students. One issue raised by these concerns is the whole question of preferential treatment in admission, including both affirmative action policies and institutional practices such as preferences toward children of alumni.

Another important issue is financial aid and the pricing of public higher education. In this connection, the policy debate is often framed using two terms that express widely accepted aims of public policy: students should have "access" to some form of higher education regardless of their income, and all applicants qualified to be admitted to an institution should have the "choice" of enrolling there regardless of the cost. Both these aims appear to be threatened by trends over the last decade, including increases in college tuitions and declines in the relative importance of federal scholarships. At the same time, questions have been raised regarding the effectiveness of existing financial aid programs. These doubts in turn have stimulated the discussion of proposals for new kinds of aid programs, some of which would tie aid to student performance.

The purpose of this first part of the present book is to examine the demand for undergraduate enrollments, focusing on both the aggregate level of demand and the composition of that demand by economic and demographic group. The remainder of this chapter sets the stage for this examination by, first, comparing college enrollments and financing in the United States to

2. For a statement of this argument, see Schultz (1972).

3. For a discussion of the importance of education in determining status, see, e.g., Sewell and Hauser (1975, 15).

those in other countries and, second, presenting the basic data on recent trends in undergraduate enrollments. Chapter 2 presents data on what is known about patterns and trends in college enrollments in the United States. It examines differences by race, sex, and economic position. It also distinguishes between initial enrollment and continued enrollment in various types of postsecondary educational institutions. Chapter 3 discusses issues raised in the economics of demand for undergraduate education, reviewing models of demand and evidence relevant to judging the usefulness of those models. It looks in particular at the rebound in the economic return to college that occurred in the 1980s and at the rise in college costs during the same period, and it reviews empirical research related to the effect of college costs on demand. It also discusses two aspects of supply that distinguish the market for higher education, both of which affect the way that demand is translated into enrollments. These are the recruitment of students and the admissions process, the importance of which differs widely among institutions. Chapter 4 deals with student financial aid programs, describing how they operate and how they have evolved over the last two decades. The chapter then considers the effects of student aid on demand. The final chapter considers all the major factors affecting demand for undergraduate places. It focuses first on aggregate enrollments in the period 1979–87, then looks at recent changes in the composition of demand, and ends with a brief discussion of implications and unanswered questions.

1.1 Demand in Comparative Perspective

Counting students in both two-year and four-year programs, college enrollment rates observed in the United States are high relative to those in other developed nations. Because systems of education differ by country, it is difficult to compare rates of college enrollment across countries. A useful comparison can be made, however, by looking at enrollment rates by age. Table 1.1 makes such a comparison. In the United States, and in most of the countries shown, 17-year-olds are still in secondary school. At this age, 89 percent of Americans are enrolled, far more than the 49 percent in Britain, but still less than the near-universal enrollment observed in West Germany. By age 20, only about 36 percent of Americans are enrolled in school. Most are students in institutions of higher education, though other postsecondary schools, such as technical institutes, account for some enrollment. At this age, the United States again ranks near the top among the countries shown, but its rate is not the highest. By age 23, school enrollment is definitely confined to a minority in all these countries. The U.S. rate of 16 percent is again among the highest.[4]

These rates illustrate one way in which the United States differs from other

4. It should be noted that different ways of classifying educational institutions can lead to different conclusions regarding relative enrollment rates. Clark (1985, 295) reports, e.g., the following rates of enrollment in higher education: Japan, 86 percent; the United States, 75 percent; France, 26 percent; Sweden, 21 percent; the United Kingdom, 20 percent; and West Germany, 20 percent.

Table 1.1 **Enrollment Rates, Selected Countries, Selected Ages, 1986–87 (percentage of age group enrolled, both full- and part-time)**

	Age		
	17	20	23
Canada	78.5	36.3	13.9
Denmark	75.4	36.4	21.8
France	79.7	28.1	10.0
Germany, West	99.7	36.6	16.8
Greece	58.7	29.0	10.3
Ireland	64.7	17.6	3.7
Japan	90.5	[a]	[a]
Netherlands	78.3	31.9	13.7
Sweden	83.0	9.5	12.5
Switzerland	83.1	30.2	15.0
United Kingdom	49.3	23.8	[a]
United States	89.0	35.7	16.2
Yugoslavia	66.3	47.3	10.1

Source: Organization for Economic Cooperation and Development, *Education in OECD Countries, 1986–87* (Paris, 1989), tables 4.2, 4.3, pp. 81, 83.

[a]Not available.

developed countries in the institutional structure of education. Secondary schools in Japan and most Western countries control the flow of students into the higher education system by means of either exit examinations, such a those used in Japan, or systems of specialized secondary schools, such as those in France. Secondary schools in the United States, by contrast, are for the most part comprehensive, and successful completion of high school virtually guarantees admission into some college or university. According to Clark (1985), the democratic values that have created support for the comprehensive school also contribute to pressure to reduce dropouts in high school. The result is a large and diverse outpouring of high school graduates with little specialized training, some of whom are not well prepared for college work. And the concern about "access" of minority groups and the poor to education is not confined to high school.

The system of higher education in the United States is distinguished from those in other industrialized countries by the importance of private nonprofit institutions. This does not mean, however, that American college students do not receive substantial government subsidies; they do, as is illustrated in Table 1.2, which compares the costs of and sources of support for undergraduate education in five countries. The first column gives estimates for the per-student total cost of college education in each country. The remaining columns show the estimated distribution of sources to cover those costs for each of two comparable income groups. In general, the distributions for the United States are distinguished by the relatively large shares borne by students and their

Table 1.2 **Estimated Costs of Higher Education in Five Countries and Sources of Funding, Low-Income and Middle-Income Families, 1985–86**

	Annual Cost (U.S. dollars)	Share of Total Costs Borne (%)					
		Low Income			Middle Income		
		Family	Public	Institution	Family	Public	Institution
Britain	3,280	6	94	0	71	29	0
West Germany	4,398	42	58	0	86	14	0
France	2,016	17	83	0	85	15	0
Sweden	4,217	55	45	0	62	38	0
United States:							
Average public	5,314	38	62	0	89	11	0
Average private	9,659	36	47	18	65	19	17
High-cost private	15,000	31	33	36	51	15	33

Source: Johnstone (1986, 148, 150). For sources and definitions of income levels, see the notes to the original figures.

Note: Family share includes contributions by students and parents.

parents. Also noteworthy is the support provided by private institutions in the United States, much of which is derived from private donations.

1.2 The Resilience of College Enrollments

The recent history of college enrollments in the United States presents one striking fact: despite a decline in the number of 18-year-olds in the population that began after 1979, college enrollments continued to increase throughout the 1980s. As shown in Figure 1.1, undergraduate enrollments increased by almost 60 percent between 1969 and 1987 at the same time that the number of young people in the traditional college age group was, in turn, rising and falling. This is an empirical puzzle that invites exploration. However, the track record of demand projections in this area makes it clear that existing models are as yet far from perfect. To illustrate the difficulty of projecting the demand for higher education, Table 1.3 compares two forecasts of undergraduate enrollments, made in the early 1970s, with the subsequent actual levels. Based largely on the demographic changes noted above, Cartter's forecast showed an 18 percent increase in full-time enrollments between 1973 and 1980, followed by a decline to 1985. Freeman's model, which also accounted for the effects of a decline in the economic returns to college training, predicted even less growth. As it turned out, of course, both sets of projections were too low. Especially surprising was the continued increase after the demographic downturn began in 1980.

Because the surprising strength of demand for undergraduate education is one of the empirical questions that motivates the present study, it is helpful to begin by examining the components of this demand. Given the demographic

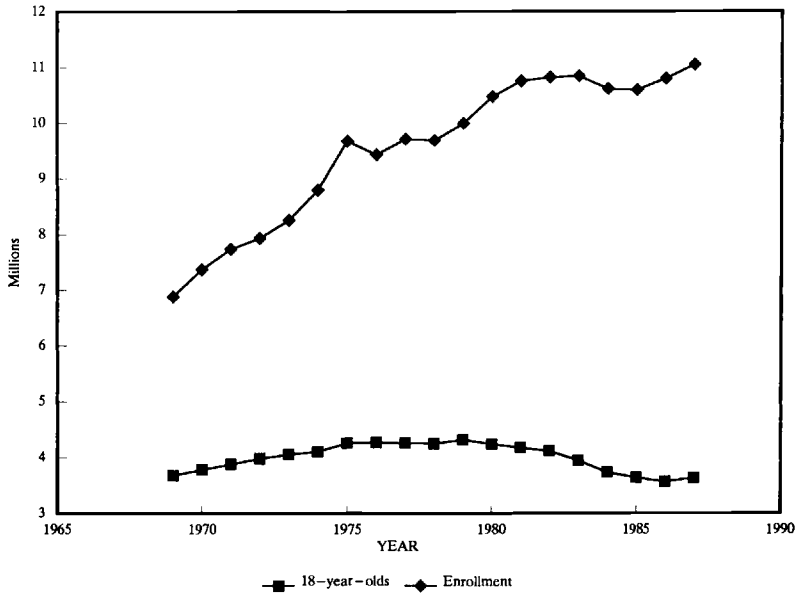

Figure 1.1 18-year-old population and underground enrollment, 1969–87.
Sources: Enrollment: U.S. Department of Education (1989, table 158, p. 177). Population: U.S. Bureau of the Census, *Current Population Reports*, Series P-25, *Estimates of the Population of the United States by Age, Sex and Race*: *1969*, No. 519 (1974), table 1, p. 16; *1970–79*, No. 917 (1982), table 1, p. 8; *1980–87*, No. 1045 (1990), table 1, p. 41.

downturn shown in Figure 1.1, only two things could be responsible for the continued rise in undergraduate enrollments in the 1980s. Either the enrollment rates for those in the traditional college-going age group had to increase, or the enrollments of older people had to increase. It turns out that increases of both kinds occurred. In order to show the contribution of each more pre-

Table 1.3 **Two Forecasts and Actual Levels of FTE Undergraduate Enrollment, Two- and Four-Year Institutions, as Percentage of 1973 Enrollment, Selected Years, 1975–1990**

	Cartter	Freeman	Actual
1973	100	100	100
1975	103	101	114
1980	118	111	118
1985	113	105	120
1987	[a]	[a]	124
1990	111	106	[a]

Source: McPherson (1978, 249); U.S. Department of Education (1989, tables 148, 158, 162). Full-time equivalents for undergraduate enrollments were obtained by applying to part-time undergraduate enrollments the ratio for each year of full-time equivalents less full-time enrollments to part-time enrollments calculated for total college enrollments and adding the result to full-time undergraduate enrollments. The ratios ranged from 0.344 in 1980 to 0.377 in 1975.

[a]Not available.

cisely, it is necessary to look at changes in enrollments for specific subgroups of the population. One by-product of this approach is that it joins the analysis of aggregate enrollments with that of enrollment composition.

College students were divided into 18 demographic groups defined by sex, race, and age, as shown in Table 1.4. Data on full-time and part-time undergraduate enrollment taken from the Current Population Survey were combined to yield estimated full-time-equivalent enrollments (FTE) for each group. Over the decade 1976–86, total FTE undergraduate enrollments in-

Table 1.4 **Changes in Population and Undergraduate Enrollments, 1976–86, by Sex, Race, and Age**

		Change in Enrollment:			
Sex, Race, and Age	% Change in Population	Due to Population Change	Due to Change in Enrollment Rate	Total	As % of 1976 Enrollment
Male:					
White:					
18–24	−4.2	−114.7	89.5	−25.2	−1.0
25–34	30.6	93.5	−138.4	−44.9	−10.1
35+	18.4	18.7	−6.1	12.6	11.7
Black:					
18–24	12.5	31.6	−34.5	−3.0	−1.0
25–34	55.4	25.8	−29.7	−3.9	−5.1
35+	22.0	6.1	6.4	12.4	58.9
Other:					
18–24	81.6	63.6	1.0	64.5	83.9
25–34	131.5	20.0	−2.8	17.2	95.2
35+	135.3	3.0	1.3	4.4	463.8
Female:					
White:					
18–24	−5.4	−141.6	171.2	29.5	1.2
25–34	27.3	100.8	110.2	211.0	81.3
35+	16.9	43.2	87.4	130.6	77.6
Black:					
18–24	8.5	31.1	−.8	30.3	8.2
25–34	50.3	31.8	3.1	34.9	58.0
35+	26.4	9.4	8.9	18.3	68.8
Other:					
18–24	64.9	57.1	33.8	90.8	167.6
25–34	102.8	11.7	3.8	15.5	205.8
35+	134.8	4.7	−2.1	2.6	46.6
Total	15.8	295.7	302.0	597.7	8.4

Source: Author's calculations based on tabulations from the October Current population Survey for 1976 and 1986, provided by Thomas Kane.

Note: Population figures exclude those in military service (for the method of decomposition, see text). FTE enrollments are the sum of full-time enrollments and one-third of part-time enrollments.

creased by some 598,000, or 8.4 percent.[5] To see how changes in each group contributed to this overall result, enrollment changes were split into two components. One portion, which measures the effect of population change, represents the change that would have occurred if the enrollment rate had been constant (at its 1986 level) and only the group's population had changed. The other portion, showing the effect of changes in the college enrollment rate, is the change in enrollment that would have taken place if population had remained constant over the period and only the enrollment rate had changed.[6] Of the 18 groups, only male and female whites in the 18- to 24-year age group declined in population over the period. Because of the large size of these groups, their declines would have resulted in a significant drop in enrollment—some 256,000. However, population growth in the other 16 groups was responsible for increases in college enrollment that would have more than offset this decline. All together, about half the total increase in college enrollments over this period can be attributed to population changes, despite the declining number of young whites.

The other half of the increase in college enrollments can be attributed to the effects of changing enrollment rates. Although rates increased in only 11 of the 18 groups, those among white women increased markedly. Owing to the large number of white women, these increases had a tremendous effect, by themselves representing an increase of about 369,000 in total enrollments.[7] There were also significant increases among young white males and young females in the residual racial group. Offsetting these increases were drops in enrollment rates among white males aged 25–34 and among black men under 35.[8] As a result of the changes in population and enrollment rates shown in Table 1.4, the composition of students over the age of 24 increased from 25 to 31. By 1986, women had become the majority of college students, rising from 49 to 53 percent of the total. And, although not shown in the table, more and more college students were studying part-time, with their share rising from 28 to 33 percent. The nonwhite share of enrollments rose slightly, from 14 to 15 percent, reflecting an increase not among blacks but among other nonwhites.

5. The corresponding increase in total undergraduate enrollments was 1.1 million. Over the period, full-time enrollments increased from 6,266,000 to 6,611,000 and part-time enrollments from 2,439,000 to 3,197,000.

6. Since enrollment is equal to the product of population and the enrollment rate, the change in any group's enrollment can be expressed as the sum of (1) the 1986 enrollment rate multiplied by the change in population and (2) the 1976 population multiplied by the change in the enrollment rate.

7. The FTE enrollment rate for white women increased 6.7 percent for the 18 to 24-year age group and 37 percent for the 25- to 34-year age group.

8. It is possible that part of the decline in enrollment rates among men over this period could be explained if there were a bulge in enrollments in 1976 of Vietnam veterans on the GI Bill. In fact, the percentage of undergraduates under 35 who were male declined rather steadily between 1970 (when it was 58 percent) and 1980 (48 percent), after which it showed no trend (U.S. Bureau of the Census 1990, table A-6). It is nevertheless possible that this effect may be important in explaining the drop in the rate for young blacks.

The strength of the demand for undergraduate education shown by these data is one of the facts that motivates Part I of this book. In the following chapters, data are presented showing that college costs increased in real terms during the 1980s and that student scholarship aid did not keep pace. Despite these factors and the decline in the number of young people in the traditional college age group, undergraduate enrollments increased. What does this experience imply about the likely effects of continued price increases? What effect do student aid programs and other public policies have on demand? Another set of questions relates to the composition of these enrollments. Are enrollments among poor and minority students following the general trend and increasing? What is the effect of tuition increases and changes in student aid on the college-going behavior of these groups? Thus, the remaining chapters in Part I will examine both aggregate demand and components of that demand.