Volume Title: Economic Challenges in Higher Education

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

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-11050-8

Volume URL: http://www.nber.org/books/clot91-1

Publication Date: January 1991

Chapter Title: Explaining the Demand

Chapter Author: Charles T. Clotfelter

Chapter URL: http://www.nber.org/chapters/c6080

Chapter pages in book: (p. 59 - 88)

3 Explaining the Demand

What can economic models contribute to an understanding of the college enrollment patterns we observe? The aim of this chapter is to go beyond the basic facts of enrollment presented in Chapter 2 in order to seek explanations based on existing models in the economics of education. In the language of economics, the process of enrollment is seen as a manifestation of demand by potential students and their families for the service called college training. (However, this parallel is not exact in that students must also contribute their own time as an input to the "production" process; thus, they become instruments of supply as well.) Enrollment then is equivalent to the quantity demanded of this service. But, as is the case in markets for other goods, the amount demanded will also depend on aspects of supply, and it is important to recognize these factors as well as those that affect only demand. In the market for undergraduate education, one especially important aspect of supply is "non-price rationing," or mechanisms other than the fluctuation in price that bring demand and supply into balance. The most prominent form of such rationing is selective admissions policies.

Section 3.1 discusses the application of economic models of demand to the case of undergraduate education. It notes that the benefits of higher education may come in monetary or nonmonetary forms. The monetary benefits, which arise from the increased earnings associated with college, provide the basis for a clear set of implications linking relative earnings and college demand. Section 3.2 examines evidence useful for judging the explanatory power of the economic model of demand. In particular, it presents information on the relative earnings of high school and college graduates and on the cost of attending college. Evidence from empirical studies of enrollment is also reviewed, and the estimated effects of economic return, cost, and other variables are noted. Section 3.3 considers two important aspects of supply in this market that influence the amount and distribution of demand—admissions and

recruitment. It focuses particularly on the criteria used in determining who is admitted and the likely effect of this process on demand. There is a brief concluding section.

3.1 Economic Models of Demand

Over the years, economists have demonstrated that almost any human activity is susceptible to analysis in terms of the formalistic concepts of microeconomics, and college training is no exception. According to economic models, people enroll in college because they believe it will do something for them. Although it is not necessary to be certain what the actual effects are in order to be able to analyze or predict behavior, it is helpful to have a notion of what goes on during the time a student is enrolled in college. Most economic models are based on the underlying assumption that education, including college education, enables students to become more productive workers. An alternative view is that colleges function primarily by identifying the most able young people rather than by transforming anyone. It is necessary to consider both these points of view in any assessment of the demand for undergraduate places. Before proceeding to these issues, however, several preliminary questions need to be addressed.

3.1.1 Issues in Applying Economic Models of Demand

In applying conventional economic models to the demand for undergraduate education, it helps to be clear on some basic questions of definition. At least three such questions are worth considering. First, how is demand in this market measured? The most obvious measure is enrollment, which can be differentiated by full-time and part-time status. An aspect of enrollment at the individual level is its timing. How long after high school do young people wait before enrolling, and do they drop out for spells after first enrolling? Another aspect of demand—one that is probably more useful than enrollments for judging demand at many institutions—is the number of applications. This measure, along with the prices that students and their families are willing to pay, serves as one metric for determining whether there has been an increase in the demand for places in highly selective colleges. Quality is another aspect in measuring the amount demanded. Few would argue that the quality of a year's enrollment is the same for all institutions, but there are no widely accepted measures of it. The use of expenditures to aggregate quantity purchased has a long history in empirical demand analysis, but this approach does not seem very promising in the case of higher education, primarily because public institutions charge tuitions that are designed to be artificially low. Another reason for caution is the diversity in "output" among institutions. What is produced at the typical community college, for example, is markedly

different in many respects from what is provided by many four-year liberal arts colleges.[1]

A second question of definition is, Who are the demanders in this market? Certainly, the students themselves are, as long as they are willing participants. Because students typically must sacrifice employment opportunities to attend college, they pay an implicit cost in terms of forgone earnings. In the case of independent adults considering whether to attend college, the conventional model of consumer and product seems to fit. But it would be unrealistic not to include the parents as active consumers as well in the large number of cases in which they pay for the bulk of the out-of-pocket expenses for dependent students.

Third, how well informed are these consumers about the service they are purchasing? A common assumption underlying most simple models of demand is that consumers possess reasonably complete information about the goods and services they consume as well as about prices. Yet it is manifestly clear that this assumption is not very realistic in some markets, especially where the good or service is technically complicated or where for some other reason judgments of quality are difficult. Certainly, college education falls into this category, but it is not obvious that it is any more difficult to compare the quality of colleges than it is to compare the quality of automobiles or television sets, for example. There are consumer magazines that publish assessments of complex consumer items, including automobiles. Similarly, a number of different guidebooks publish information on colleges and universities. Controversy has surfaced in recent years, however, regarding one news magazine's attempt to provide a ranking of the best colleges, with college officials denouncing the exercise as a "travesty."[2]

3.1.2 What Explains the Demand?

Economic models of higher education, like those explaining any voluntary activity, rest on individual comparisons of benefits and costs. It is convenient to identify benefits of two kinds—the monetary return in the form of higher earnings available to graduates and other, nonmonetary benefits. As to the first, it is widely believed that college training will increase an individual's lifetime earnings potential. No more succinct statement of this view is available than that reported by Henry Adams ([1918] 1946, 305–6). As a member of the Harvard faculty in the 1870s, Adams asked one of his students what he intended to do with his college education. The student replied, "The degree of Harvard College is worth money to me in Chicago."

1. For a study of what characteristics of colleges are thought to be important indicators of quality by high-ability students and their parents, see Litten and Hall (1989).

2. Deirdre Carmody, "Ranking of 'Best Colleges' Rankles Many Educators," *New York Times*, 25 October 1989, p. 23. For the rankings referred to in this case, see *U.S. News and World Report*, 16 October 1989.

In the economics literature, this view finds expression in the theory of human capital, which envisions the prospective student as making the decision about whether to enroll in college in the manner any investor evaluates a potential investment. The costs of the investment, which include the earnings that would be forgone during college, are weighed against the likely returns, which come in the form of increased earnings. Such a student invests up to the point at which the marginal benefit of another unit of education no longer exceeds its cost.[3]

That college graduates usually earn more than nongraduates is clear. Exactly why this is so is another question. The explanation normally associated with the human capital model is that college training makes a person more productive and thus able to command a higher wage in the labor market. An alternative view is that colleges and universities function primarily to sort or screen high school graduates, identifying the ones with the most ability. According to Arrow (1973), higher education can be seen as providing a two-part filter enabling society to select able people—one part the selection of applicants and the other the failing out of the those who perform poorly. The emphasis in this model is selection rather than any enhancement in productivity. A college degree becomes a credential, one helpful in obtaining increased earnings but one more or less unrelated to any training that might occur during college.[4]

Students and their families may also derive nonmonetary benefits from college. One can think of many reasons to desire college training that are unrelated to future employment prospects, ranging from increased appreciation for literature or geological formations to the social and recreational activities available to students on most college campuses. At one level, these nonpecuniary motives for enrolling in college are no different from the preferences that underlie the consumption of most goods and services. There is, of course, no accounting for tastes. Taken to one extreme, the motives underlying college enrollment may be something close to an imperative of social class. Among some groups in society, the notion that a child would not go to college is almost heresy, no matter what the monetary return. For these demanders, "that ancient and honorable degree"[5] of bachelor of arts or science amounts to a minimum level of acceptable education. From recreation to social class requirements, considerations such as these are usually lumped together as "consumption" aspects of college. They constitute no less a valid foundation for

3. For discussions of the human capital model as applied to education, see Becker (1964) or Freeman (1986). For a recent review and discussion of the demand for higher education, see Becker (1990).

4. A corresponding change, according to this point of view, has been an increase in the credential requirements of jobs corresponding to the increase in the number of people with college degrees. Fallows (1985, 55) cites surveys that indicate a marked increase since the Depression in the percentage of employers who require a college degree.

5. Words taken from the traditional conferring of bachelor's degrees by the dean of arts and sciences at Duke University.

the demand for college than the desire for increased future earnings, and they are assumed to be part of measured demand.[6]

With regard to monetary benefits, the economic model of demand provides a clear empirical implication: a given person will tend to invest in more education as the economic payoff increases. According to the model, an increase in the earnings differential between high school and college graduates will tend to increase the amount of college training demanded. An increase in the college earnings advantage, whether it were attributable to screening or to the productivity effects of college training, would still enhance the attractiveness of going to college from the student's perspective. From society's point of view, however, it is important to know the extent to which education-related earnings differential can be attributed to the training itself. Because college students on average tend to have higher measured ability than those who do not go on beyond high school, only a portion of the observed earnings differential can be attributed to college training. Most statistical studies have concluded that this portion is relatively large, with no more than about 15 percent of observed differences being due to factors other than education, but a recent study by Behrman et al. (1980) suggests that nonschool factors are much more important.[7]

Another important set of implications of the economic model of demand relates to the costs of education and the role of capital market imperfections. According to that model, an increase in college costs will decrease college enrollment. An increase in the level of tuition, for example, would be expected to decrease the demand for higher education. Another reason for high costs is imperfection in the capital market arising from the ignorance, risk, and lack of collateral that are inherent in the market. The increased cost of capital caused by these problems would also tend to decrease the amount of education demanded (see, e.g., Becker 1964; or Nerlove 1972). This problem may be especially severe for high school graduates from low-income families, who tend to have much less ready access to capital than their more affluent counterparts. In the presence of these imperfections, the human capital model predicts that equally able students from the former group will be less likely to go to college than those from the latter. Adding to the disparity created by differential access to capital, disadvantaged students may also simply face more risk, owing to discrimination or a more volatile return to education. According to one survey, the percentage of respondents who think higher education is a good investment rises with income.[8]

6. For an extended discussion of the demand for education, see Freeman (1986, 367).

7. Their estimates imply that, when family background, including genetic effects, is held constant, the estimated effects of schooling on earnings fall by as much as two-thirds (Behrman et al. 1980, 28).

8. For a discussion of these survey results, and for an elaboration of this argument, see Mortenson, (1990, 33–34, 28). Mortenson also notes (pp. 43ff.) that low-income individuals may be more risk averse. Both these factors would explain a reluctance on the part of low-income families to use loans to finance college.

3.2 Evidence

Economic theory suggests that the demand for undergraduate places should be affected by the potential economic reward from attending college, the cost of attending college, and other factors that might influence the "consumption" aspects of college. This section presents two kinds of evidence on such influences relevant to the demand for undergraduate places. The first is evidence on broad trends in the variables thought to be important. The second kind of evidence comes from statistical studies intended specifically to analyze the demand for college. The section begins by focusing on the two most prominent sets of factors, economic returns and costs. Then it turns to a consideration of other factors that appear to be important in explaining the demand for undergraduate places.

3.2.1 The Economic Payoff of Attending College

In 1987, college graduates earned half again as much as high school graduates and also experienced less unemployment than others in the labor force. Among men aged 25–34, college graduates earned an average of $34,485, while those who had completed only high school earned an average of $22,990. As noted above, not all this earnings premium can be attributed to education itself, but enough of can be to cause the economic payoff to be seen as a major determinant of demand. As noted below, statistical studies show that college enrollment usually goes up when the economic payoff goes up. This consideration thus assigns a central role to the labor market in the determination of the demand for higher education.

The story of the last two decades of changes in relative earnings in the United States has been one of bust and boom for college graduates. During the 1970s, the relative earnings of college graduates declined markedly, apparently as the result of large increases in the supply of college graduates. In Table 3.1, the college earnings advantage is measured by the percentage difference by which average earnings for college graduates exceeded that for high school graduates. This measure is distinct from the rate of return, which is calculated below. As shown in Table 3.1, the college earnings advantage fell between 1970 and 1979, from 42 to 29 percent for men and from 45 to 37 percent for women, prompting the suggestion that the country may have "overinvested" in college training.[9] By around 1980, however, labor market conditions—a slowing in the growth of new graduates and continued increases in the demand for educated workers—had combined to reverse this decline. As a result, the college earnings advantage rose again, eventually exceeding the previous peak differentials observed around 1970 (see, e.g., Murphy and Welch 1989). Table 3.1 also shows that college graduates have enjoyed considerably lower rates of unemployment than those with less education, further contributing to the apparent economic advantage of college.

9. For discussions of the overinvestment question, see Becker (1964) or Freeman (1975a).

Table 3.1 **Earnings and Unemployment by Educational Attainment, 1970, 1979, and 1987**

	1970	1979	1987
Mean earnings (ages 25–34):[a]			
Men:			
High school graduates ($)	8,999	16,537	22,990
Some college ($)	10,398	17,829	25,534
College graduates ($)[b]	12,779	21,324	34,485
College earnings advantage (%)[c]	42	29	50
Women:			
High school graduates ($)	5,629	10,563	16,237
Some college ($)	6,409	12,244	19,331
College graduates ($)[b]	8,171	14,494	25,329
College earnings advantage (%)[c]	45	37	56
Unemployment rate (ages 25–64):			
All	3.3	4.4	5.7
High school graduates	2.9	4.4	6.3
Some college	2.9	3.5	4.5
College graduates[b]	1.3	2.1	2.3

Sources: U.S. Bureau of the Census, *Current Population Reports*, Series P-60, *Money Income of Households, Families and Persons in the United States*, No. 80 (1971), table 49; No. 129 (1981), table 52; and No. 162 (1989), table 35; Bureau of Labor Statistics, Bulletin no. 2340 (Washington, D.C.: U.S. Government Printing Office, August 1989), table 67.

[a]Year-round, full-time workers.

[b]Four or more years of college.

[c]Percentage diffenence between mean earnings for college over high school.

To see how the relative earnings of college graduates changed year by year, Figure 3.1 shows data over time for both the college enrollment rate for 18- to 24-year-olds and the college–to–high school earnings ratio for men aged 25–34. According to the later series, the college earnings advantage reached a peak in 1969, fell thereafter, reaching its nadir in 1980, and finally rose again, exceeding its previous high during the 1980s. The figure also shows the unemployment rate for those aged 20–24; this rate climbed fairly steadily until 1982, after which it receded somewhat.

From the perspective of an individual who is contemplating whether to attend college, these changes in relative earnings could loom large. To illustrate the effect of these changes in a format made familiar by the human capital model, Table 3.2 summarizes calculations of the financial payoff from attending college as viewed from the perspective of a high school graduate in each of three years. In the spirit of similar calculations of the returns to schooling (see, e.g., Becker 1964; or Freeman 1975a), the individual is assumed to compare (1) the lifetime earnings stream of the average high school graduate to (2) a four-year investment in college followed by the lifetime earnings of an average college graduate. Calculations such as these are meant to be illustrative rather than realistic, in that they implicitly assume that an individual

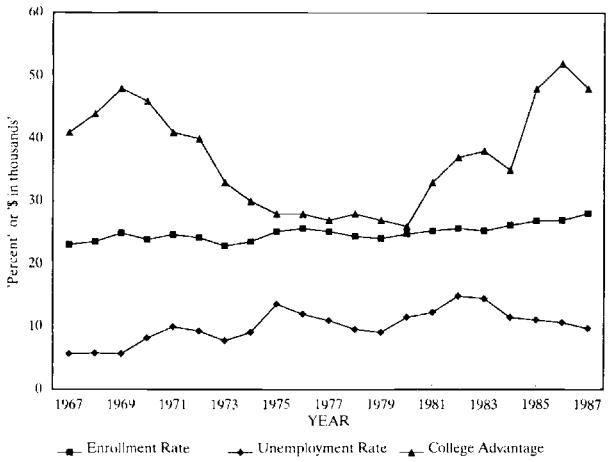

Figure 3.1 College enrollment, unemployment, and college earnings advantage, 1967–87.

Sources: Total undergraduate enrollment: estimated, as 86.0 percent of total enrollment in institutions of higher education (the ratio for 1969 and 1970), from U.S. Department of Education (1989, table 148, p. 167 [for 1965–68], and table 158, p. 177 [1969–88]). 18–24 population: U.S. Bureau of the Census, *Current Population Reports*, Series P-20, *School Enrollment—Social and Economic Characteristics of Students: October 1986*, No. 429 (1988), table A-8. Unemployment rate: U.S. Bureau of Labor Statistics, *Labor Force Statistics Derived from the Current Population Survey, 1948–87*, Bulletin no. 2307 (Washington, D.C.: U.S. Government Printing Office, August 1988), table A-31. College–to–high school earnings advantage: unpublished estimates, provided by Richard Freeman and McKinley Blackburn, of the ratio of the average income of men with 16 years of schooling to that of men with 12 years of schooling, full-time year-round workers aged 25–34.

knows with certainty the alternative earnings streams open to him or her in the future.[10] In addition, the entire college versus high school earnings differential is assumed to be due to additional schooling; to the extent that this is not true, of course, the calculated returns to college are overstated. On the other hand, if college training increases the nonmarket incomes of graduates, the calculated returns will be understated. Private returns take into account costs and benefits relevant to the individual: out-of-pocket tuition and other costs and increases in after-tax earnings. Social returns are based on resource costs of education, using average costs, and increases in total output, measured by before-tax earnings. Table 3.2 summarizes investment outcomes in both of two conventional forms: as a present discounted value (using a discount rate of 2 percent) and as an internal rate of return.[11] All amounts are expressed in 1988 dollars.

10. One way such uncertainty could be reflected would be to use a discount rate that approximates the rate of return to risky assets rather than a risk-free rate. Alternatively, the earnings differentials themselves could be adjusted, with no change to the discount rate.

11. The internal rate of return is defined as that discount rate that makes the discounted present value equal to zero.

Table 3.2 **Calculated Returns to College Training Based on Average Earnings by Age, Sex, and Education**

	1970	1979	1987
Present value of investment (1988 dollars)[a]:			
Private			
Men	244,600	202,400	267,900
Women	124,100	86,300	144,700
Social:			
Men	315,700	287,700	363,500
Women	139,300	103,400	185,400
Rate of return:			
Private:			
Men	8.6	7.5	9.6
Women	7.6	6.5	8.5
Social:			
Men	8.3	7.3	9.1
Women	6.6	5.6	7.8

Sources: U.S. Bureau of the Census, *Current Population Reports*, Series P-60, *Money Income of Households, Families and Persons in the United States*, No. 80 (1971), table 49; No. 129 (1981), table 52; and No. 162 (1989), table 35; U.S. Internal Revenue Service, *Statistics of Income—Individual Income Tax Returns* (Washington, D.C.: U.S Government Printing Office, 1970), table 1, p. 7, and (1979), table 1.1, p. 9; *SOI Bulletin* (Spring 1989), Fig. M, p. 14; U.S. Bureau of the Census, *Statistical Abstract of the United States* (Washington, D.C.: U.S. Government Printing Office), *1980*, p. 308; *1981*, p. 328; *1982–83*, p. 259; *1988*, pp. 270, 341; *1989*, p. 315; U.S. Department of Education (1989, 168, 281, 300).

[a]Present values were calculated in constant dollars using a 2 percent discount rate for a person age 18 who expected to work through age 64 and who is considering attending college full-time between ages 19 and 22. Expected earnings were based on mean money income of year-round full-time workers with high school only and four or more years of college, by sex, for four age groups: 25–34, 35–44, 45–54, and 55–64. Workers under 25 were assumed to earn the average for the 25–34 age group. Private returns were calculated after federal income, social security, and state income taxes. Average federal income tax rates were calculated according to income level. A single average state income tax rate was calculated for the nation for each year. For the three years, the social security tax rates were 0.048, 0.0715, and 0.0715. The calculated average state income tax rates were 0.014, 0.022, and 0.027. Private returns account for the direct cost of college by using the average tuition, room, and board for all colleges and universities. The social returns were calculated using before-tax incomes and estimates of the average educational and general expenditures per full-time-equivalent student. The 1985–86 average, adjusted for inflation, was used for 1987. In current dollars, average costs (tuition, fees, room, and board) were $1,635, $2,809, and $5,510 in the three years. The figure for 1970 was calculated as the weighted average of tuition, fees, room, and board of all public and private college institutions, using enrollments as weight.

For both men and women, the calculations indicate that college is a good investment: the present values are positive, and the rates of return exceed comparable real rates that borrowers generally face. Of course, the force of this conclusion is blunted to the extent that measured earnings differences overstate the pure effect of additional education. What is most important about the table, however, is the pattern of change in the measured returns over time, a pattern whose shape depends little on the assumption one makes about the

independent effect of schooling on earnings differentials. The central message of Table 3.2 is the decline in the measured return from 1970 to 1979 and its subsequent rebound. Despite real increases in college tuitions, noted below, the changing labor market conditions illustrated here and in Table 3.1 increased the attractiveness of college training as a purely financial investment. Calculations of both private and social returns support this conclusion.

How has the return to college education differed by sex and race? Table 3.2 suggests that calculated returns based entirely on average earnings differentials yield substantially higher returns for men than for women, though the differentials appear to have narrowed between 1979 and 1987. Table 3.3 examines changes in percentage earnings differentials by sex and race between 1969 and 1987. For the years shown, the college earnings advantage was lowest in either 1974 or 1980 for each of the four groups. The recent improvement in the earnings advantage has been the greatest for black males (from 28 to 90 percent) and the least for black females (from 82 to 92 percent in 1984, followed by a fall to 89 percent in 1987). Supporting these conclusions, Murphy and Welch (1989, 20) find similar patterns over time when workers are classified by years of experience. The increase in the college earnings advantage from the late 1970s to the late 1980s has been widespread.

There is persuasive evidence that earnings differentials such as these exert an important influence on college enrollments. Freeman (1986) cites results from five time-series studies for the United States, all of which imply that increases in the college earnings advantage lead to increases in college enrollment. Referring to his own estimates, Freeman (1975a, 304) states, "The major factor determining enrollments of college graduates in the period under study was the state of the labor market." Estimates of the implied elasticity of enrollment with respect to earnings for college graduates range from 0.7 to 1.8. Studies using cross-sectional data also support the importance of earnings differentials. Bishop's (1977, 297) analysis of the college enrollment

Table 3.3 **College Earnings Advantage by Sex and Race, Selected Years (percentage difference in mean incomes of college graduates and high school graduates, 25 years and older)**

	Male		Female	
	Black	White	Black	White
1969	48	59	93	67
1974	28	46	85	58
1980	38	57	82	66
1984	73	67	92	79
1987	90	77	89	86

Source: U.S. Bureau of the Census, *Current Population Reports,* Series P-60, *Money Income of Households, Families and Persons in the United States,* No. 75 (1970), table 47; No. 101 (1976), table 58; No. 132 (1982), table 51; No. 151 (1986), table 33; No. 162 (1989), table 35.

choices of 20,000 high school juniors in 1960 yielded the expected effect, but only for those in the middle two ability quartiles. Analyzing a sample of World War II veterans, Willis and Rosen (1979) found that predicted earnings gains had a significant effect on the decision to attend college. In addition, some limited support of the model was provided by a study by Fiorito and Dauffenbach (1982) of undergraduates' choices of major field.[12]

Despite the support that empirical studies have given this particular implication of the economic model of demand for higher education, projections based on estimated models have not succeeded in predicting future enrollments. For example, Freeman's model implied that, as a result of the decline in the rate of return to college training, college enrollments would increase by only 5 percent between 1973 and 1985—in fact, however, they increased by 20 percent (see Table 1.3). A more extreme example is given by a model developed by Dresch (1975), which reflects both the demand for college places, as a function of relative earnings, and the labor market's response to changes in the supply of educated workers. On the basis of the anticipation that increases in the number of college graduates would drive down their salaries, thus reducing the incentive for high school graduates to go to college, the model projected a 33 percent decline in college enrollments between 1970 and 2000, a drop far greater than anything that appears to be likely in 1990.[13] Another question is raised by the failure of enrollment among black males to follow the strong increase in the college earnings advantage for them, shown in Table 3.3. It should be quickly noted that the validity of models can never be judged solely by the accuracy of their predictions since other variables not accounted for in the equation could well change over time. But these results do certainly argue for caution in the use of such models.

3.2.2 Costs

A second major factor in the demand for undergraduate education that would figure prominently in most economic models is cost. The most obvious costs are of course the tuition and fees paid by students and their families, but economists have been quick to point out that there are important implicit costs as well, in the form of forgone earnings. As with the earnings data above, it is useful both to document recent changes in costs and to review evidence regarding their effect on demand. That college tuitions have been rising in recent years is a fact that has been reported widely. To provide some perspective on this increase, Table 3.4 summarizes data on college costs for selected academic years between 1959–60 and 1987–88. The cost figures shown do

12. In their analysis of trends in enrollments in the arts and sciences, Turner and Bowen (1990) suggest that students may be more sensitive to job prospects in bad economic times than in prosperous periods.

13. As summarized in Table 2.9, projections to 2000 based on the assumption of a continuation of 1988 enrollment rates imply an increase in 19 percent over the 1976 total of 11.1 million (see also Table 2.8).

not account for scholarships, a point that is discussed below. Averages, all expressed in 1988 dollars, are shown separately for universities, other four-year institutions, and two-year colleges and are further split between public and private. The top section of the table combines tuition, required fees, room and board; the second section shows only tuition and required fees. A comparison of these two sections shows why an emphasis on tuition alone may be misleading. Both the differences between public and private institutions and changes in costs over time in public institutions appear to be smaller when room and board are included.

Focusing on the more inclusive measure of costs, Table 3.4 clearly shows

Table 3.4 **Trends in College Costs (amounts in constant 1988 dollars)**

	School Year						
	1959–60	1964–65	1969–70	1974–75	1979–89	1984–85	1987–88
Tuition, room, and board:[a]							
Public:							
All	3,277	3,568	3,668	3,437	3,108	3,747	3,960
University	3,521	3,947	4,153	3,870	3,571	4,287	4,680
Other four-year	2,918	3,256	3,461	3,426	3,156	3,868	4,060
Two-year	2,250	2,396	2,900	2,944	2,616	3,086	3,160
Private:							
All	6,047	7,162	7,714	7,483	7,052	9,018	10,390
University	6,798	8,270	8,903	8,963	8,458	11,262	13,220
Other four-year	5,699	6,798	7,379	6,940	6,748	8,630	9,970
Two-year	4,141	5,464	6,077	5,697	5,385	6,820	6,790
Ratio of private to public (all)	1.3	2.0	2.1	2.2	2.3	2.4	2.6
Tuition:[a]							
Public:							
All	799	913	985	950	837	1,068	1,160
University	939	1,119	1,302	1,317	1,206	1,524	1,750
Other four-year	623	841	933	985	950	1,228	1,320
Two-year	316	372	543	609	510	642	690
Private:							
All	3,173	4,086	4,674	4,655	4,494	5,844	6,820
University	3,705	4,871	5,516	5,748	5,471	7,523	8,770
Other four-year	2,934	3,842	4,476	4,297	4,336	5,646	6,670
Two-year	1,739	2,636	3,153	3,006	2,960	3,832	3,910
Ratio of private to public (all)	4.0	4.5	4.7	4.9	5.4	5.5	5.9
Tuition, room, and board as % of family income:							
All public	14.6	13.7	12.2	11.4	10.3	12.3	12.3
All private	26.9	27.4	25.6	24.8	23.4	29.6	32.3

Sources: U.S. Department of Education (1989, table 258); U.S. Department of Education (1969, table 120); U.S. Bureau of the Census, *Statistical Abstract of the United States* (Washington, D.C.: U.S. Government Printing Office, 1988), table 700.

[a]Includes required fees. In-state tuitions and fees are used for calculations.

that college costs have risen, in real terms, over the nearly three decades covered by the table. Costs at both public and private institutions rose from their 1959–60 levels and then fell again in the late 1970s, in the case of public institutions almost to their previous levels.[14] During the 1980s, however, the trend in costs has been all upward. Costs have increased in every institutional category, ranging from 21 percent for public two-year colleges to 56 percent for private universities. For the latter group of institutions, this increase amounts to a remarkable 5.7 percent annual growth rate in costs, over and above tuition.

These are the increases that served to focus public attention on college costs during the 1980s, creating a mini-firestorm of debate over the management of colleges and universities, as discussed in Part III. Such increases have a different relevance in the current section. Namely, what do they imply for college enrollments? One way to begin answering that question is to relate the increases to a measure of capacity, such as family income. The last two rows in Table 3.4 do this. Using this yardstick, the increases in college costs, at least on the public side, look less ominous. The average cost for public institutions in 1987–88 was actually a smaller percentage of median family income (12.3 percent) than it was in 1959–60, though it is higher than it was at the beginning of the 1980s. For private institutions, the recent steep increases have pushed the cost-to-income ratio to unprecedented heights, reaching almost one-third in 1987–88. One aspect of the changes in college costs made clear by this table is the relative cost of public and private institutions. Based on tuition, room, and board, costs at private institutions exceeded those at public institutions by about 30 percent in 1959–60, but they have been at least double the public figure since then. In the most recent year shown, the average private cost was 2.6 times the average public cost, and the ratio for universities was 2.8.

The figures shown in Table 3.4 fail to reflect economic costs in at least two respects. First, the figures measure only the "sticker price" of college; they do not reflect the price discount implicit when institutions award scholarships out of internal funds. Aggregate financial data on the ratio of scholarships and fellowships from unrestricted funds to tuition and fees can be used to approximate the size of this discount. In 1979–80, the average discount calculated in this way was 6.7 percent for public institutions and 8.2 percent for private. By 1984–85, the discounts had diverged, with the public rate falling to 6.6 percent and the private rising to 11.0. Taking these discounts into account would modify the trends shown in Table 3.4 only slightly, however. For example, netting out the discount implies that the private-public ratio of costs was 2.2 in 1979–80 and 2.3 in 1984–85, instead of 2.3 and 2.4, respectively.[15] The

14. The overall average cost for public institutions in 1979–80 is lower than the comparable average in 1959–60 only because of an increase in the share of two-year enrollment; the average cost for each of the three types of institutions actually increased over the period.

15. Calculations of the ratio of scholarships and fellowships from unrestricted funds to tuition and fees from students are based on U.S. Department of Education (1989, 293–94, 302–3).

Table 3.5 **The Economic Cost of College: Some Illustrations (1988 constant dollars)**

	1969–70	1974–75	1979–80	1984–85	1987–88
Forgone earnings:[a]					
Male	15,480	14,937	13,619	12,909	12,925
Female	9,177	9,011	8,677	9,077	9,128
Tuition, room, board, and forgone earnings:					
Public university:					
Male	19,632	18,807	17,189	17,195	17,605
Female	13,330	12,881	12,248	13,364	13,808
Private university:					
Male	24,383	23,900	22,076	24,170	26,145
Female	18,080	17,974	17,135	20,339	22,348
Ratio, private/public:					
Male	1.2	1.3	1.3	1.4	1.5
Female	1.4	1.4	1.4	1.5	1.6
Tuition and forgone earnings:					
Public two-year college:					
Male	16,022	15,546	14,129	13,551	13,615
Female	9,720	9,620	9,187	9,719	9,818

[a]Calculated as three-fourths (to reflect the proportion of the calendar year taken up by school) mean earnings for full-time, year-round workers, aged 25–34 for high school graduates multiplied by one minus the unemployment rate for high school graduates in the labor force, reduced by 20 percent to reflect income and payroll taxes.

effects of scholarships and other financial aid on demand are discussed in more detail in Chapter 4.

Perhaps the more important shortcoming of the cost figures shown in the table is that they ignore the forgone earnings of attending college. It is useful to ask whether looking at costs using the broader economic concept changes the conclusions one draws from the recent history of college tuition hikes. Table 3.5 attempts to broaden this perspective by adding forgone earnings to produce a measure of total college costs over time.[16] Despite the refinements used in defining it, the measure of forgone earnings employed here is still quite crude, based as it is on market-wide averages. As is evident from the table's first two rows, forgone earnings for males have exceeded those for females over the nearly 20-year period covered by the table, though this gap has narrowed. For a student of either sex, however, it is clear that forgone earnings make up a significant share of total costs. For a male attending a private university in 1987–88, for example, forgone earnings represent just under half total costs; for a female attending such an institution, forgone earn-

16. For the purpose of Table 3.5, forgone earnings are defined somewhat more exactly than for the calculations used for the rates of return in Table 3.2, whose calculations were intended to parallel those of Freeman (1975a). Forgone earnings are here defined as three-quarters of mean high school earnings for workers 25–34, the three-quarters reflecting the proportion of the calendar year taken up by school, adjusted by the applicable unemployment rate and taxes.

ings amount to about 40 percent. Owing to the rapid increase in private tuitions, the share of forgone earnings in total costs has of course fallen for those attending private institutions, but it remains a significant portion.

One implication of measuring costs using this broader concept is that the relative cost disadvantage of private institutions evident in Table 3.4 is substantially reduced. Whereas a comparison using out-of-pocket costs shows that private universities are 2.8 times as expensive as public ones, for example, the inclusion of the forgone earnings measure used here reduces the ratio to 1.5 for men and 1.6 for women. These higher private costs do not necessarily imply that the rate of return to private college education is less than that to the public alternative, however, since the earning advantage may differ as well.[17] For comparison, Table 3.5 also presents the opportunity cost of attending a public two-year institution on the assumption that there would be no additional room and board costs. In this case, forgone earnings become by far the dominant portion of total costs.

Numerous statistical studies have examined the effect of changes in tuition and other costs on college enrollment, and the expected negative sign has been generally found. Two of these studies, by Radner and Miller (1975) and Manski and Wise (1983), illustrate the complex methodological issues that must be addressed in assessing the effect of costs or other variables on college choice. Both these studies use a model that explicitly recognizes the fact that high school graduates have several discrete options, including different kinds of colleges as well as not enrolling at all. They conclude in general that the probability of college attendance is negatively related to college costs. A review of 25 studies, by Leslie and Brinkman (1987), yielded a consensus effect, measured as the decline in the college enrollment rate for a $100 increase in tuition, of 0.7 percentage points. The median among the estimates produced by 10 studies cited by McPherson (1978) yields approximately the same value. Based on the corresponding mean values, this coefficient translates to an elasticity of about -0.7.[18] The conclusion that tuition exerts a negative effect on college enrollment is also confirmed in recent research based on the analysis of individual behavior (see, e.g., Ehrenberg and Sherman 1984; or Schwartz 1986).

Two questions of special importance are whether financial aid has an opposite (and equal) effect on enrollment and whether this tuition effect differs according to the income level of the student. The evidence regarding the first question tends to support the symmetry of tuition and financial aid effects, though the coefficients are not always equal in absolute value.[19] Obviously,

17. Ehrenberg (1989) provides evidence of a comparative earnings advantage for graduates of law schools of private universities. Earnings equations presented by James et al. (1988) suggest that higher financial returns are associated with attendance at selective institutions.

18. If the enrollment rate is 33 percent and average tuition in units of $100 is 34.2 ($3,400), the elasticity would be -0.73.

19. For the clearest test of these effects, see Manski and Wise (1983, 112ff.).

this finding is important in any assessment of the likely effects of financial aid programs. As for variation in the tuition effect by income, most studies that address it suggest that low-income students are most responsive to changes in tuition.[20]

Despite the high degree of consensus in statistical studies regarding the effect of college costs on demand, the recent experience of many selective institutions seems to belie this finding. Applications to the nation's most prestigious colleges and universities appear to have increased at the same time as tuitions were rising at unprecedented rates. Over the period 1981–88, for example, applications to Harvard increased by 7 percent while Harvard's tuition and fees rose by 27 percent in real terms, and applications to Williams rose by 18 percent at the same time as its cost rose by 31 percent. These are by no means unrepresentative examples. Could it be that demand for undergraduate places at some institutions is not affected by cost? Or are these increases in applications merely an artifact of a broader increase in the average number of applications submitted per individual?

In order to assess the effect of changes in college costs on applications to selective institutions, I examined information on tuition and fees and applications for a sample of 24 selective colleges and universities for the years 1981–88. By comparing rates of tuition increase among schools, it was possible to determine whether unusually large increases were associated with declines in applications relative to an institution's historical level. Regressions estimated for this sample gave absolutely no indication that tuition increases exerted a negative effect on the number of applications an institution receives. Nor was an institution's "yield" rate—the percentage of accepted applicants who matriculate—influenced by tuition increases.[21] For this group of colleges, over this period at least, it appears that demand was quite insensitive to price. This finding is certainly at variance with the price sensitivity observed in numerous statistical studies. The most reasonable explanation is that demand for places in the most highly selective colleges and universities is, at least within the range of tuitions observed in the 1980s, unlike the demand for college places in general. The relatively high proportion of students at such institutions who are receiving aid may explain some of this insensitivity to price; institutional

20. See, e.g., Radner and Miller (1975, 66) and Leslie and Brinkman (1987, 198). For a contrary finding, see Ehrenberg and Sherman (1984, 218), who find a smaller elasticity for the poor than for other applicants.

21. Two basic regressions were estimated to explain applications and yield. One equation, in which the logarithm of the number of applications was the dependent variable, included dummy variables for each year and institution as well as the institution's tuition and lagged tuition, both measured in constant dollars. The coefficients on the tuition variables (standard errors in parentheses) were 0.72 (0.44) and 0.54 (0.51), respectively. Although neither was significant at the 5 percent level, an F-test showed that they were when taken together, suggesting that tuition might actually exert a *positive* effect on applications to these institutions. This might be the case if price were taken to be a signal of quality. The second equation used the change in the logarithm of applications as the dependent variable and produced coefficients of -0.07 (0.42) for the change in tuition and 0.84 (0.50) for the change in lagged tuition, the latter coefficient being significantly different from zero at the 10 percent level. Similar equations using the yield rate as the dependent variable produced insignificant coefficients for the tuition variables.

pledges to meet full need reduce or eliminate the net marginal cost of tuition increases for these students.

3.2.3 Income

There is no more common variable to be found in empirical studies of demand than income: for most commodities, the amount consumed increases with the income available to the consuming unit. In the case of college enrollment, however, the effect of income is not so straightforward. In the human capital model, family income does not itself appear as a factor in the decision to invest in college. Only to the extent that the payoff from investing in college or a student's access to capital increases with family income does this model suggest that a student's family income may be associated with demand. It is not easy to think of reasons why at least the first of these should be the case. It is far easier to imagine why the nonpecuniary component of demand for college might increase with income. To the extent that college can be viewed as one (expensive) form of family consumption, purchased for a variety of reasons that may include prestige, a positive income elasticity is not a surprising thing to find. College is in fact a highly income-elastic commodity. As shown in Chapter 2, the propensity to enroll in college rises with family income. Studies of the demand for higher education, using various measures for demand, likewise indicate a consistently positive income effect.[22] Among those who enroll, there is abundant evidence that average expenditures on college rise with family income (see, e.g., Hearn 1988; and Astin, various years). Expensive, highly selective colleges also tend to enroll comparatively affluent students.

There is reason to believe that the demand for college by the families of these upper-income students may have experienced a surge during the 1980s. Incomes for households at the top of the income distribution grew rapidly. Between 1977 and 1987, the average income of households in the top fifth of the income distribution increased in real terms by 12.5 percent, compared to just 2.8 percent for households below them.[23] In addition, the effect of these income trends on consumption was bolstered by cuts in federal income taxes and increases in the value of major household assets. The federal income tax cuts of 1981 and 1986 both reduced the tax burdens of many high-income taxpayers. Households in the upper half of the income distribution also experienced increases in net worth owing to a strong stock market and sharply increasing house values.[24]

22. See, e.g., Galper and Dunn (1969), Spies (1978), Bishop (1977), Corman (1983), and Schwartz (1986). The income effect becomes more complicated as various college alternatives are considered. Radner and Miller (1975), e.g., examine nine different types of colleges. The income effect on attendance is consistently positive only for the three classes of high-cost institutions (p. 64).

23. U.S. Bureau of the Census, *Current Population Reports*, Series P-60, *Money Income of Households, Families, and Persons in the U.S.*, No. 162 (1989), Table 12.

24. See, e.g., Richard W. Stevenson, "Housing Prices Expected to be Sluggish in the 90's," *New York Times*, 6 April 1990, p. A1.

One apparent result of these favorable trends among the affluent was an increase in the demand for high-cost colleges. Because the number of places at these colleges is more or less fixed, this apparent surge in demand was not marked by a rise in enrollments. Instead, its manifestations include an increase in the number of applications to highly selective colleges, increasing difficulty in obtaining admission, and the rise in demand for courses that coach students for taking standardized tests.[25] Another manifestation may be the increase in tuition at these institutions: a shift in demand where supply is fixed produces an increase in the market-clearing price. Although the prices charged are below that market-clearing level, as indicated by the continuance of excess demand, this apparent shift in demand has certainly allowed institutions in this submarket to increase prices without adverse effects.

3.2.4 Other Influences on Demand

Among the variables that have been found to explain college enrollment, at least three others are worth noting in particular: perceived quality of the institution, availability or proximity, and the military draft. These are in addition to the personal characteristics noted in Chapter 2, such as parents' education, measured aptitude, and high school grades, which also show up consistently as important factors explaining college enrollment.

Perceptions of Quality

Although the proposition would be widely accepted that consumers' evaluations of the quality of various colleges affect demand, the process by which consumers form their evaluations is not at all self-evident. One recent study that looked at this question showed that high-ability students most often saw as indicators of quality a large variety of courses, small classes, and well-equipped laboratories and libraries, while their parents placed greatest stress on faculty who teach as well as do research (Litten and Hall 1989, 313).[26]

25. For a discussion of the possibility that many families are "buying up" by turning to more expensive colleges, see Edward B. Fiske, "Private Colleges Flourish Despite Forecasts That They Will Shrivel Away," *New York Times*, 7 September 1988, p. B8. For other indications of increasing demand for these institutions, see, e.g., Deirdre Carmody, "Better Students Finding Colleges Reject Them," *New York Times*, 20 April 1988, p. B11, and "Coaching Courses for S.A.T.'s Show Sharp Rise," *New York Times*, 28 September 1988, sec. 2, p. 14.

26. As noted earlier in this chapter, one of the most prominent recent attempts to measure quality has been the rankings of colleges published by *U.S. News and World Report*. One interesting question related to these rankings is whether they have had any effect on demand. I examined this question for the sample of 24 prestigious colleges and universities that was analyzed above in connection with the effect of tuition on demand. The magazine's first ranking, published in November 1983, listed 17 of the 24 as being among the top 20 universities and liberal arts colleges in the country ("Rating the Colleges," *U.S. News and World Report*, 28 November 1983, pp. 41–48). Regressions explaining both applications and yield rates for the larger sample of institutions showed no indication that being included in these rankings had any effect on demand. For a description of the sample and the estimated equations, see text and n. 21 above. The equation used here is the same except that it adds a dummy variable for those institutions listed in the *U.S. News* ranking.

Some statistical studies have used an institution's average SAT score as a measure of perceived quality. Manski and Wise (1983, 18–19) found that the probability of a student's choosing an institution rose with this measure up to a point and then declined when the institution's average score exceeded the student's own score by more than 100 points.

Proximity

Over the last three decades, the tremendous expansion of public institutions, particularly the two-year community colleges, has markedly increased the availability and proximity of colleges. One way of seeing how this expansion affected the availability of higher education, viewed from the perspective of potential students, is to look at the percentage of 18- and 19-year-olds who lived in a county containing a college or university. In Illinois, for example, this percentage increased from 76 percent in 1950 to 92 percent in 1986. In New York, the corresponding increase was from 89 to 97 percent.[27] These figures illustrate the increased ease of attending an institution of higher education. It has been the expansion of community colleges and, to a lesser extent, state colleges that has been largely responsible for this increased availability, and the geographic distribution of the student bodies in these institutions bespeaks their largely local character. In the fall of 1989, for example, 70 percent of those attending North Carolina's community colleges lived in the same county where the college was located, and another 19 percent lived in an adjacent county.[28]

Despite the historic association between enrollment growth and increasing geographic accessibility of college, the evidence is far from overwhelming that accessibility actually leads to higher rates of college enrollment. Bishop (1977, 296) took his findings on cost effects from the early 1960s to imply that locating a college centrally within a community or establishing a four-year college where none had previously existed would increase the probability that a young person would enroll in college. However, studies that examined more directly the influence of proximity on college enrollment do not imply a

27. Calculations were made for four states. Similar changes in the percentages from 1950 to 1986 were also observed in the two other states: Delaware, from 80 to 100 percent, and North Carolina, from 53 to 92 percent. Counties containing colleges or universities were identified for the 1949–50 and 1985–86 academic years using Office of Education, Federal Security Agency, *Education Directory: Higher Education* (Washington, D.C.: U.S. Government Printing Office, 1949); and U.S. Department of Education, Office of Educational Research and Improvement, *Education Directory: Colleges and Universities, 1985–86* (Washington, D.C.: U.S. Government Printing Office, 1986). Corresponding populations were taken from the U.S. Bureau of the Census, *General Characteristics of the Population* (Washington, D.C.: U.S. Government Printing Office, 1953, 1983). I am grateful to Michael Dieffenbach for his assistance in obtaining this information.

28. Figures are for students in college transfer programs in community colleges (*Statistical Abstract of Higher Education in North Carolina, 1989–90* [Chapel Hill: University of North Carolina, April 1990], 36–38). Comparable percentages of undergraduate students from the same county were 23 percent for the University of North Carolina system and 17 percent for private colleges and universities.

strong effect. Although having a college nearby will affect the chance of attending that college, it generally does not have a large effect on the chance of attending any college.[29]

Military Draft

Although the military draft is not at present a consideration for potential college students, it certainly has been a major factor in the past. In their time-series analysis of the demand for higher education, Galper and Dunn (1969) show that enrollments have been affected by both the growth in the size of and discharges from the armed forces. The latter, along with the funding provided by the GI Bill, propelled many veterans into colleges following World War II and the Korean War. The effect of the size of the military and the existence of the draft itself was a function of draft policies toward students. Student deferments available in the 1960s appear to have boosted college enrollments.[30] Bishop (1977, 301) found that high school students in districts with the greatest draft pressure were more likely to enroll in college than were others.[31] The overall college enrollment rate climbed steadily during the Vietnam buildup of the late 1960s, although this was also a period in which the economic payoff from college training was also increasing.[32]

3.2.5 Summing Up

Two principal implications arising from economic theories of demand for college are that enrollments will be affected by the economic return available to graduates and by the net cost of attending college. There is considerable evidence that both of these influences are empirically important, although there are exceptions, such as the apparent price insensitivity of those applying to highly selective private institutions. A thorough statistical analysis of the effect of recent trends on the demand for higher education is beyond the scope of this part, but the general rise in enrollment rates is at least consistent with the implications of the economic model, in that the college earnings advantage has grown, as has the unemployment rate for young people. An analysis of

29. Both Anderson, Bowman, and Tinto (1972) and Weiler (1986) conclude that the effect of proximity is small.

30. Statements to this effect are found in Riesman (1980, 8) and the 1960 annual report for the selective service. The latter stated, "Many young men would not have pursued higher education had there not been a Selective Service program of student deferment" (quoted in Bishop 1977, 301).

31. Draft pressure was defined as the ratio of draft physicals to the stock of men classified as eligible for service. This measure differed among states because of differences in classification policies.

32. The size of the U.S. military force in Vietnam grew from 184,000 in 1965 to a peak of 536,000 in 1968, declining to less than 25,000 in 1971. The percentage of 18- to 24-year-olds enrolled as undergraduates rose from 22.1 in 1965 to 24.9 in 1969, falling to 22.9 in 1973. (*Sources:* see the legend to Figure 3.1; and U.S. Bureau of the Census, *Statistical Abstract of the United States* [Washington, D.C.: U.S. Government Printing Office], table 355 [1964], table 383 [1968], table 397 [1970], table 540 [1975], and table 598 [1977]; U.S. Department of Education [1989, table 148 (p. 167) and table 158 (p. 177)].)

recent trends would also have to take into account the apparent influence of the rise in relative incomes among the most affluent households.[33]

3.3 Rationing and Recruitment

Colleges and universities engage in two important activities that are designed to affect the size of their enrollments and the quality of their matriculants. Although these two functions are quite distinct from one another and may even appear to work at cross-purposes, the responsibility for both within a given institution typically resides in the same administrative office. The first function, evocative of the stern-faced gatekeeper, is the selection of candidates for admission. Often the source of anxiety among aspiring students, this is the traditional function of college admissions offices. In recent years, however, the prospect of a decline in the 18-year-old population has spurred institutions to devote more attention to a second function, recruitment. In the language of economics, the first constitutes a form of non-price rationing, while the second is simply marketing—the supplier's attempt to influence the demand curve.

33. As a means of suggesting the likely influences on demand, I used the data presented in Figure 3.1 to estimate an equation explaining the overall college enrollment rate for the period 1966–87. The explanatory variables included the unemployment rate for 18- to 24-year-olds, the size of the American military force in Vietnam, the mean real household income and the mean income of households in the top quintile, a weighted average of real tuition and fees in colleges and universities, and the college earnings advantage. The tuition and fees measure was a fixed-weight average of average public and private tuitions and fees, with the weight for public being 0.75, which approximates the average public share of enrollments over the period. Only three of these variables were statistically significant, and each had estimated effects in the expected (positive) direction; these were the unemployment rate, the size of the military forces in Vietnam, and the average income for households in the top quintile. The remaining variables had estimated coefficients that were very small in relation to their standard errors.

The basic estimated equation (*t*-statistics in parentheses) was

$$\begin{aligned} \text{ENR} = {} & 1.54 + 0.414\ \text{UNEMP} + 0.00659\ \text{MILITARY} - 0.005\ \text{CEA} + \\ & (0.2) \quad (2.8) \qquad (2.3) \qquad (0.1) \\ & 0.000373\ \text{TOP5MINC} - 0.00026\ \text{MINC} + 0.00016\ \text{TRB}, \quad R^2 = 0.83 \\ & (2.1) \qquad (0.5) \qquad (0.2) \end{aligned}$$

where ENR is the college enrollment rate, UNEMP is the unemployment rate for those 20 to 24 years of age, MILITARY is the size of the U.S. military force in Vietnam in thousands, CEA is the college earnings advantage, TOP5MINC is the real mean income for households in the top quintile of the income distribution, MINC is the real mean household income, and TRB is a weighted average of real tuition, room, and board for public (weighted 0.75) and private (0.25) institutions. (*Sources:* see Figure 3.1). When CEA was dropped from the equation, it became possible to derive estimates using the period 1965–88. In this equation, the mean household income variable (MINC) was negative and significant, with the other variables that had been significant and positive remaining so. The finding of a significant effect for the unemployment rate is consistent with the human capital model, though the insignificance of the earnings advantage is not. The significance of the top quintile average income is interesting, especially in light of the lack of significance for average household income. This finding is consistent with the view of higher education as a consumption good with a high income elasticity. Because of its high level of aggregation, however, this equation offers little more than suggestive evidence on the importance of these variables and certainly does not provide an adequate test of the economic model of demand.

At the outset, it must be admitted that there is little empirical research on how the admissions function affects demand. To be sure, some empirical studies of demand include such measures of selectivity as the average SAT scores for institutions (see, e.g., Radner and Miller 1975; and Manski and Wise 1983), but little is known about the effect of rationing places on the total demand for college or how the process influences the composition of demand. Even if the effects of such rationing are not fully understood, it seems useful at least to note its importance in this market. Few other important classes of consumer expenditures are subject to such rigorous non-price rationing. Furthermore, the admissions and recruitment functions have implications for public policy with regard to institutional preferences toward applicants of certain groups. It seems likely, for example, that affirmative action policies have increased the number of minority students in selective colleges and universities, yet these policies remain the subject of continuing debate. In 1990, the Education Department suggested that scholarships designated for minority students might be forbidden.[34] Another policy that may affect the composition of student bodies is the preferential treatment that many institutions give to children of their alumni.[35] Although their effects cannot necessarily be quantified, forms of non-price rationing such as this deserve to be noted.

3.3.1 College Admissions Policies

Difference in Selectivity

Probably the most important descriptive statement that can be made about admissions policies in American colleges is that there exists tremendous diversity in the degree of selectivity of institutions. At one end of the spectrum are the handful of highly selective colleges and universities that offer admission to only a fraction of their applicants, most of whom are quite talented and accomplished. At the other end are a large number of institutions with more or less open admissions policies. The degree to which selectivity differs among institutions is clearly illustrated by a 1983 survey that asked college administrators to characterize their institutions' admissions policies, summarized in Table 3.6. If "open admissions" is defined as admitting any high school graduate, the table shows that over 90 percent of the public two-year colleges surveyed and almost half the private two-year institutions had open admissions policies. Among the four-year colleges and universities in the sample, 28 percent of the public and 18 percent of the private institutions had open admissions. In contrast, there were very few two-year colleges and relatively few four-year institutions that could be characterized as highly selec-

34. At the time this was being written, it was not clear whether this restriction would be put in place. See Michel Marriott, "Colleges Basing Aid on Race Risk Loss of Federal Funds," *New York Times*, 12 December 1990, p. A1.

35. For a comment on such preferential treatment, see Jerome Karabel and David Karen, "Go to Harvard, Give Your Kid a Break," *New York Times*, 8 December 1990, p. 17.

Table 3.6 Selectivity by Type of Institution (percentage of institutions)

	Two-Year		Four-Year	
Degree of Selectivity	Public	Private	Public	Private
Any individual wishing to attend will be admitted	41.8	3.0	2.0	1.5
Any high school graduate will be admitted	48.9	46.5	26.0	16.1
The majority of individuals who meet qualifications will be admitted	8.6	47.5	60.6	62.9
Only a limited number of those who meet the qualifications will be admitted	.7	3.0	11.4	19.5
Total	100.0	100.0	100.0	100.0
Number of institutions responding	419	106	403	779

Source: Survey of financial aid administrators at 2143 institutions in Van Dusen and Higginbotham (1984, 4, 44).

tive. Administrators at only about 200 of the 2,143 colleges in the sample said that they rejected a majority of qualified applicants.

Differences in degree of selectivity may also be observed in the wide variation in percentage of applicants accepted for admission. For example, of the 48 four-year colleges and universities in North Carolina in 1988–89, only five admitted fewer than half those who applied for admission. These five accounted for 29 percent of total applications received by all four-year institutions but only 16 percent of total acceptances. By contrast, there were 27 institutions that accepted 70 percent or more of their applicants; these accounted for 28 percent of total applications and 40 percent of all acceptances.[36] Although figures such as these certainly indicate that selectivity differs greatly among institutions, it should also be noted that the acceptance rate is by no means a perfect measure of selectivity. The degree of self-selection among applicants surely differs among institutions, as does the practice of submitting multiple applications. Where state colleges offer an effective guarantee to high school students who meet certain requirements, for example, there is little point for students not meeting those requirements to apply, nor is there reason for qualified students wishing to go there to apply elsewhere. A consequence of this self-selection, on top of the large percentage of nonselective schools, is that most students are admitted to their first choice among the

36. Calculations based on *Statistical Abstract of Higher Education in North Carolina, 1989–90* (Chapel Hill: University of North Carolina, April 1990), tables 67–68, pp. 137–40.

colleges to which they apply. In 1989, 69 percent of all freshmen reported that the college they were attending was their first choice.[37]

The clear differences in selectivity among institutions suggest a simplified model of demand and supply in which there are just two kinds of institutions: "nonselective" and "selective." The former follow an open admissions policy, accepting all candidates they deem qualified, while the latter reject at least some qualified applicants. It seems reasonable to assume that, over the period relevant for analysis, the size of the student body that can be accommodated by any institution is limited by the size of its staff and plant. Each institution is assumed to enroll all qualified applicants, charging a constant price, until this capacity constraint is reached. The left part of Figure 3.2 illustrates the supply and demand curves for a representative nonselective college under these assumptions. For the nonselective college, enrollment is given simply by the intersection of its supply curve and the demand curve for that institution's places. Enrollment in such an institution might be influenced by the tuition it charges or by other factors that affect demand, such as the economic payoff for college training.

In the case of the selective college, by contrast, there is excess demand at the prevailing price. In the right part of Figure 3.2, the graph for the selective college shows that there are A_3 qualified applicants willing to enroll at the price being charged but that there is room for only A_2. The difference between these two figures is the number of students who must be rejected and is thus an indication of the institution's relative degree of selectivity. While the same factors might affect the demand for a selective college, the results of shifts in demand are not the same. Since enrollment is by definition fixed, shifts in demand have no effect on the number of applicants accepted.[38] What then will be the effect of such shifts? If this were a market in which prices adjusted so as to bring supply and demand into balance, the effect of an outward shift in demand would be an increase in the price. But most of the evidence that we have about the higher education market suggests that suppliers do not charge such market-clearing prices. While the possibility remains that colleges enjoying excess demand might choose to raise their prices at the expense of some degree of selectivity, the policy of selectivity itself suggests that colleges do not charge as much as they might otherwise be able to.[39] Excess demand is the sine qua non of selectivity.

Criteria for Admission

If price is not used to ration demand for places in the selective colleges, what kind of non-price rationing is employed? By what criteria are the scarce positions allocated to aspiring entrants? History offers examples of a number

37. *Chronicle of Higher Education*, 24 January 1990, p. A3.

38. For the purpose of this model, the otherwise important issue of variation in yield rates is ignored. These applicants should be thought of as applicants who will attend if offered admission.

39. The degree of selectivity may, of course, influence demand.

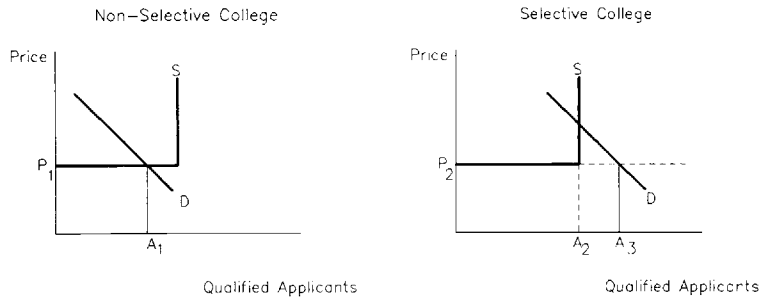

Figure 3.2 Supply and demand for places: selective and nonselective colleges.

of possible forms of non-price rationing, ranging from queues, lotteries, and elaborate rationing systems to bribes and the use of other forms of influence over the allocation process. Comparing this list to what we know about the process of college admissions serves to emphasize the allocation mechanisms that are usually *not* employed by colleges. The notion of first come first served plays little role in admissions, although most institutions do impose deadlines for applications. Nor is random choice normally employed (which is not to deny that a coin may occasionally be tossed behind the closed doors of an admissions committee during the last hours of decisions rounds).

Most striking in this enumeration of unutilized rationing mechanisms is perhaps the virtual absence of bribes and the insignificance of many forms of economic and political influence. In his eloquent brief for the private selective university, Rosovsky (1990, 71) makes this point forcefully: "The system is not corrupt: pull, personal influence, bribery—buying your way into Yale or Duke—are inconsequential factors." A distinction may be in order here. At some institutions, certainly some private ones, children of the rich and powerful may sometimes enjoy higher probabilities of admission than they would have if they had not been well born. Such favoritism is defended by appeal to the possibility of future benefits to the institution that might flow from a favorable decision. But decisions based on threats, bribes, or other quid pro quo agreements are rare indeed.

This set of circumstances makes the acceptance letter to a selective college an unusual commodity. Although valuable—with a theoretical "market price" that may be far in excess of its sticker price—it can be neither traded nor bid for. For other commodities with high income elasticities, such as automobiles and vacation homes, the rising incomes of the affluent in the last decade have had their predicted effect on demand. Strong demand is also reflected in the prices of assets in fixed supply, such as land. But places in selective colleges have been one desirable commodity whose supply has increased little and whose price remains below what it would be in an unconstrained market. In these circumstances, there are limits on what additional income can do to raise the chances of a child's acceptance into a prestigious college. One possibility

is to enroll the child in a private secondary school; another is to sign up for courses that prepare students to take standardized tests. There is evidence that both these forms of expenditure have enjoyed increases over the last decade.[40]

The criteria that *are* used in selecting applicants can be (and have been) described in great detail (see, e.g., Boyer 1987), and it is not the purpose of the present volume to do so again. It is useful, however, to give a broad-brush summary of the admissions policies of selective colleges and to note their implications. At the risk of excessive simplification, it is possible to define the admissions process as an effort to apply objective criteria to discriminate among candidates, where the criteria are to a large extent under the control of the institution. This process focuses on two sets of characteristics of applicants: those that are closely related to the student's educational achievement or promise and those that are not.

Included in the first group are both the familiar academic traits, as reflected by high school grades, essays, recommendations, and standardized test sores, and the educationally relevant characteristics that may be evident in a student's participation in some extracurricular activities. Needless to say, institutions differ in how they define, measure, and weigh these characteristics. But two general points can be made. First, most admissions officers are on the lookout for "well-rounded" students (see, e.g., Boyer 1987, 36–37). Second, virtually all selective colleges pay attention to standardized test results, though the questions of how much weight these scores receive and ought to receive are matters of continuing debate.[41] Boyer (1987) argues for a decrease in emphasis on such tests, largely on the basis of a series of interviews with admissions directors. He reports that only one of the 29 admissions directors interviewed listed standardized test scores as the most important criterion for admission to their institution, and 62 percent of those interviewed said that the absence of the tests would have had little or no effect on the composition of their accepted class (p. 34). But these findings are weak evidence indeed for the proposition that standardized tests are unimportant in admissions. Boyer also reports that scores often cause students to adjust their sights, applying to less selective colleges if their scores are not as high as they expected. Such sorting among candidates could well increase the homogeneity of a given college's applicant pool, making it less important for admissions officers to use scores to differentiate among candidates.

The second set of characteristics used by admissions officers to select students are those more or less unrelated to a student's academic or other educational development. These may include characteristics of the student, such as

40. Between 1970 and 1987, enrollment in non-Catholic private secondary schools increased by 81 percent at the same time that the total enrollment in secondary schools fell by 9 percent (U.S. Department of Education 1989, 62, 68).

41. A recent attack on the use of standardized tests in college admissions came from Fallows (1980). For a discussion of the use and usefulness of standardized test results in admissions decisions, see Klitgaard (1985).

his or her race, religion, or region or whether he or she is an athlete who has been recruited to play on a college team. Or they may be characteristics of the student's parents, with preference often being extended to children of alumni or faculty and sometimes to children of wealthy or important people with no institutional connection. Preferences of the first kind are common. Some colleges give preferential treatment, for example, to applicants from underrepresented regions. Certainly, many athletes receive preferential treatment at the colleges and universities that compete seriously in the heavily televised sports. Race and religion, of course, have long been used as bases of discrimination, and many colleges in the United States explicitly discriminated on the basis of race into the 1960s.[42] At present, the two most important issues regarding the use of race as a basis for admissions are affirmative action policies and racial quotas. Affirmative action is a widely accepted practice, defended as a means of both compensating for past injustices and adding to the diversity of college student bodies.[43] In contrast, no college would admit to using quotas, a device that some charge has been employed against applicants of Asian descent.[44] Other preferences, such as those to children of alumni, appear to be widely accepted,[45] while the suggestion that children of the wealthy may be favored is troubling to many.

It is far easier to describe college admissions criteria in general terms than it is to determine their aggregate effect on patterns of enrollment. Admissions policies are difficult to observe or to quantify, and the whole process of admissions is variegated and decentralized, with each institution running its own operation. Still, there do appear to be common tendencies across institutions in admissions policies, and it is useful at least to consider their possible effects. Two questions arise in particular. The first has to do with the emphasis placed on standardized tests and especially their effect on the allocation of educational resources in the precollege years. As noted above, standardized tests have become an important factor in the process of matching students to colleges, and they have been used increasingly by public school systems to assess school performance. Such tests affect the allocation of resources to the extent that their administration displaces classroom work and students and teachers spend time preparing to take the test. An independent panel recently reported that elementary and secondary students are given about 127 million standardized tests a year, or approximately three tests per child per year. There

42. In 1970, the Legal Defense Fund of the National Association for the Advancement of Colored People brought suit against ten states (Arkansas, Florida, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, Pennsylvania, and Virginia), charging that they operated segregated state systems of public higher education. During the next two decades, the federal government pursued the desegregation of public systems, in part by requiring these states and eight others (Alabama, Delaware, Kentucky, Missouri, Ohio, South Carolina, Texas, and West Virginia) to submit desegregation plans (*Chronicle of Higher Education*, 5 July 1990. p. A1).

43. For a defense of considering race in admissions decisions, see, e.g., Bowen (1977).

44. See, e.g., Robert Lindsey, "Colleges Accused of Bias to Stem Asians' Gains," *New York Times*, 19 January 1987, sec. 1, p. 10.

45. For an exception, see n. 35 above.

is also concern that secondary school teachers may be spending too much time focusing on standardized tests.[46] While these tests and the adjustments they engender are certainly important, it is unclear if they contribute to or detract from overall educational achievement.

A second question that arises about the effects of admissions policies, including the use of standardized tests, is whether the process taken as a whole produces an unintended bias against poor and minority applicants. The question of whether the tests are culturally biased is one that has long been debated. As was noted in Chapter 2, there is a strong association between SAT scores and income. Beyond any biases inherent in standardized tests, it is possible that other admissions practices favor the affluent. Certainly, the preference given to children of alumni, who surely have incomes higher than the average applicant at most institutions, has this effect. Moreover, Lewis and Kingston (1989) have argued, without much evidence, that preferences given to athletes and residents of underrepresented regions have a similar bias, as does the preference for "all-around" students. Over against these general policies, with their uncertain effects, is an explicit policy maintained by almost all colleges that admissions decisions are to be made independent of a student's financial need. A survey in 1983 revealed that more than 94 percent of private colleges maintained such a "need-blind" admissions policy, as did over 98 percent of public colleges (Van Dusen and Higginbotham 1984, 79).

3.3.2 Recruitment

As discussed in business schools, "marketing" is a function that is engaged in by any firm that sells a product. It encompasses such decisions as product design, pricing, and promotion. By this definition, colleges and universities have long engaged in marketing, including promotion. Harvard College distributed printed brochures to recruit students as early as 1643,[47] and there are few colleges operating today without a supply of handsome promotional booklets to send out to prospective students. But promotion takes other forms as well, including visits by admissions officers to secondary schools and college-night programs, special weekends when prospective students are invited to campus, and appeals by way of direct mailings. The last of these has been a form that has apparently grown in importance in recent years, thanks to computer technology and a ready supply of prospect lists. The organizations that administer standardized college entrance tests routinely sell lists of students who take the tests along with other information the students provide. Often by hiring other firms specializing in identifying prospects, colleges can customize these lists in a variety of ways to suit its particular needs—all stu-

46. See Jean Evangelauf, "Reliance on Multiple-Choice Tests Said to Harm Minorities and Hinder Reform; Panel Seeks a New Regulatory Agency," *Chronicle of Higher Education*, 30 May 1990, p. A1.

47. Edward B. Fiske, "In the Campaign to Attract Applicants, College Brochures Are Often a Glossy Foot in the Door," *New York Times*, 11 October 1989, p. 21.

dents from the Southwest who score above 1300, for example. Colleges can then send information with personalized letters to prospective high school students.[48]

Articles about the college recruiting function suggest that it has assumed a more important role in recent years as the number of new students has leveled off, but there is no objective information on the amount or nature of recruiting available with which to verify the existence of a trend.[49] Nor is there evidence on which institutions are spending the most on recruiting, although most of the examples given in newspaper accounts are for relatively nonselective private colleges. Similarly, there is some evidence that colleges and universities are spending more money to improve the appearance of their campuses and to provide more amenities to students, all of which would fall into the traditional definition of marketing through product design.[50] However, it is again difficult to know how widespread such actions are or whether their importance has in fact increased in recent years.[51]

3.4 Summary

At least two kinds of motives underlie the demand for undergraduate education. One of these, the desire for higher earnings, plays a prominent role in economic models of demand for education, but there is nothing in these models that necessarily excludes nonmonetary motives from consideration as well. In support of the economic model is considerable evidence that college enrollment rises with an increase in the expected economic return from obtaining a degree. The earnings advantage enjoyed by college graduates over high school graduates fell during the 1970s, but it reversed course in the 1980s. The improving prospects for college graduates is one likely explanation for the continued strength of enrollment through the 1980s. There remain some unanswered questions, though, and one is why the very strong increase in the college advantage for males was not accompanied by increases in their college enrollment rates.

48. One company advertises that its service "will help you yield far more successful results from each dollar and minute you devote to your admissions/recruitment process" (advertisement in the *Chronicle of Higher Education*, 20 September 1989, p. A39; see also Riesman 1980, 110).

49. For example, Robin Wilson ("College Recruiting Gimmicks Get More Lavish as Competition for New Freshmen Heats Up," *Chronicle of Higher Education*, 7 March 1990, p. A1) states, "In their zeal to attract students, more and more colleges are courting prospective freshmen with lavish parties, glossy videotapes, and expense-paid weekends." "Madison Avenue Intersects with College Avenue" (*New York Times*, 9 April 1989, sec. 4A, p. 7) contains a similar statement about the rising importance of recruiting: "Increasingly, many lesser-known colleges and universities feeling the pinch of declining applicant pools are resorting to clever and expensive marketing ploys to attract applications."

50. See, e.g., Michele Collison, "In Buyer's Market, Colleges Turn to Posh Dorms and Fast Food to Lure Students," *Chronicle of Higher Education*, 20 September 1989, p. A37, which offers examples of amenities ranging from fast-food courts to expanded athletic facilities to cable television.

51. For available information on the changing pattern of expenditures of colleges and universities, see Part III.

A second implication arising from economic theory—and this applies to demand for whatever reason—is that the amount demanded will be adversely affected by increases in the cost of attending. Again, there is considerable empirical support for this implication, most of it based on analyses of cross-sectional data, though demand for places in highly selective institutions seems to be an exception to this general rule. In the two decades leading up to 1980, the cost of college generally fell, and the increasing number of institutions simply made college easily accessible to more high school graduates. However, the 1980s saw rapid increases in the real costs of attendance, with more rapid increases occurring in private institutions.

Although it is not at all clear how the admissions process should be fit into an integrated model of demand, it seems important at least to consider its role in shaping enrollments. Institutions differ enormously in their selectivity. While there are a few colleges and universities whose standards of admission would effectively bar most high school graduates from enrolling, many institutions accept virtually any applicant with a high school degree. Enrollment at institutions in the latter group is determined simply by the rate of tuition and the demand curve for places. But enrollment in selective institutions is limited by an institutionally set cap; increases in the number of applicants who desire admission beyond that point merely add to the administrative burden of selecting an entering class. It follows that selective institutions charge less than the theoretical market price for their product. In light of the strong and growing demand for places at selective institutions, it remains an interesting question as to why those institutions have not raised tuitions even more than they have. Another unanswered question of interest is the larger one of how the admissions and recruitment functions have affected the actual composition of college enrollments.