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ABSTRACT

This edition, 21st in a series, provides revisions of projections shown in the preceding volume and includes statistics on elementary and secondary schools and institutions of higher learning at the national level. Data include projections for enrollment, graduates, instructional staff, and expenditures to the year 2002. Selected projections are also given for the state level. This edition also includes a section on new developments in projecting education statistics that includes enrollment projections by race and ethnicity. A methodology section describes the ways that projections are made and the models used. Most projections include three or four alternatives based on different assumptions about growth. Public and private school enrollments are projected to increase in the period, passing the 1971 peak, with a reversal in the recent decline in secondary school enrollments. While enrollment in higher education is expected to increase, the rate of growth is expected to slow after 1990. Increases in the numbers of classroom teachers and in expenditures per pupil are also forecasted. State level K-12 public school enrollment and public high school graduates are expected to increase, but these increases will vary across the nation. Five technical appendices contain details about the projection methodology; and present supplementary tables, a table of mean absolute percentage errors, an outline of data sources, and a glossary. The text contains 100 figures and 46 tables, and the appendices contain an additional 34 tables. (SLD)

NATIONAL CENTER FOR EDUCATION STATISTICS

2002

U.S. Department of Education
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PROJECTIONS OF EDUCATION STATISTICS TO 2002

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National Center for Education Statistics

"The purpose of the Center shall be to collect, and analyze, and disseminate statistics and other data related to education in the United States and in other nations."—Section 406(b) of the General Education Provisions Act, as amended (20 U.S.C. 1221e–1).

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Foreword

This edition of *Projections of Education Statistics to 2002* is the 21st report in a series begun in 1964. This report provides revisions of projections shown in *Projections of Education Statistics to 2001: An Update* and includes statistics on elementary and secondary schools and institutions of higher education at the national level. Included are projections for enrollment, graduates, instructional staff, and expenditures to the year 2002. In addition, this report includes selected projections of education statistics (elementary and secondary enrollment and high school graduates) to the year 2002 for public elementary and secondary schools at the state level. These projections were produced to provide researchers, policy analysts, and other users with state-level projections developed with a consistent methodology. They are not intended to supplant detailed projections prepared in individual states.

Also included in this edition is a section on new developments in projecting education statistics, which contains projections not previously published by the National Center for Education Statistics. Presented are projections of higher education enrollment by race/ethnicity.

The report also contains a methodology section describing models and assumptions used to develop the national and state-level projections. The projections are based on an age-specific enrollment rate model, exponential smoothing models, and econometric models. The enrollment model uses population estimates and projections from the Bureau of the Census. The exponential smoothing models are based on the mathematical projection of past data patterns into the future. The econometric models use projections of exogenous variables from The WEFA Group, an economic forecasting service. Therefore, assumptions regarding the population and the economy are the key assumptions underlying the projections of education statistics.

Most of the projections include three or four alternatives, based on different assumptions about growth paths. Although the first alternative set of projections (middle or middle-high alternative) appearing in each table is deemed to represent the most likely projections, the other alternatives provide a reasonable range of outcomes.

A summary of these projections is available in a pocket-sized folder, *Pocket Projections 2002*. A summary of selected projected education statistics is shown in figure 1.

Roger A. Herriot, Associate Commissioner
Statistical Standards and Methodology Division
November 1991

Acknowledgments

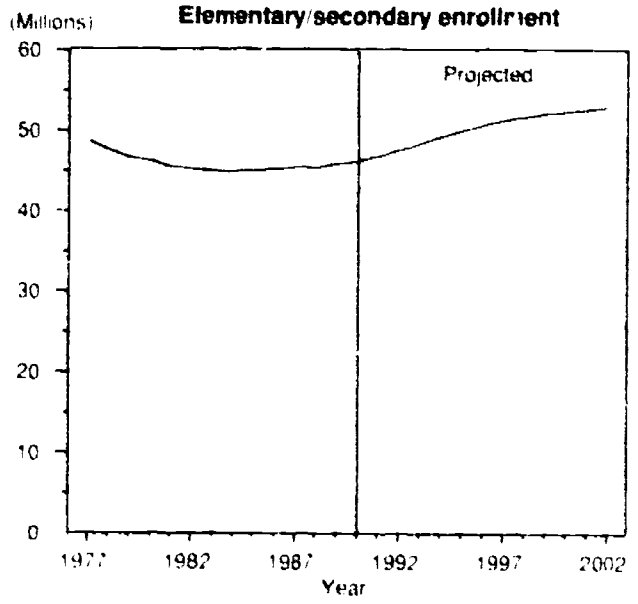
Projections of Education Statistics to 2002 was produced by the National Center for Education Statistics in the Statistical Standards and Methodology Division under the direction of Roger A. Herriot, Associate Commissioner. The report was prepared by Debra E. Gerald, Mathematical Statistician, and William J. Hussar, Financial Economist.

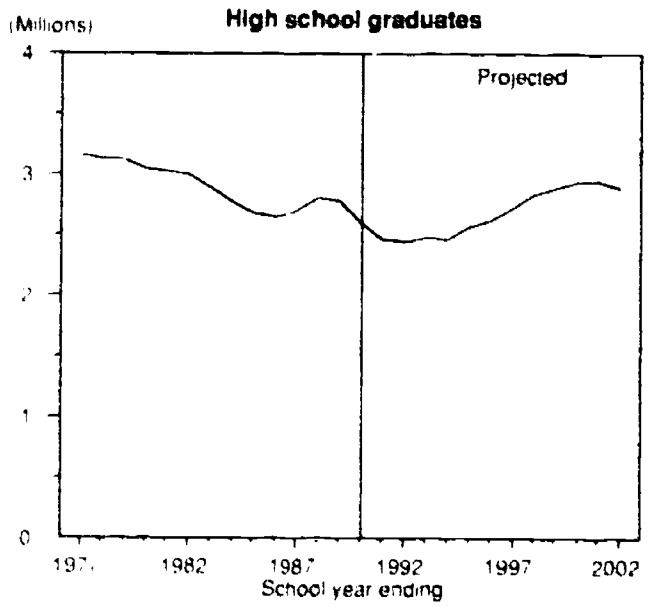
Debra E. Gerald was responsible for the overall production of the report and prepared the national projections of the following: elementary and secondary enrollment (chapter 1); higher education enrollment (chapter 2); high school graduates (chapter 3); earned degrees conferred (chapter 4); and classroom teachers (chapter 5). She also prepared state-level projections of public elementary and secondary enrollment (chapter 7) and public high school graduates (chapter 8), and national projections of higher education enrollment by race/ethnicity (chapter 9). In addition, she prepared the appendixes explaining the methodology used in obtaining the national and state-level projections. William J. Hussar prepared the national projections of expenditures of public elementary and secondary schools, including public school teacher salaries (chapter 6), and the appendix explaining the methodology used to obtain these projections.

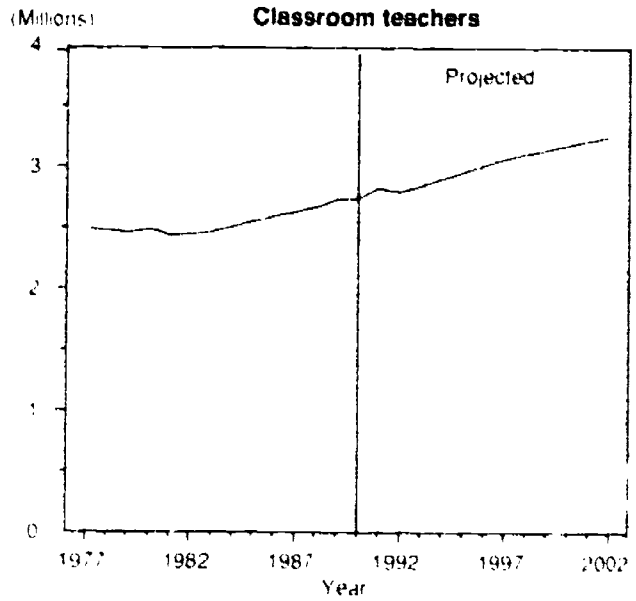
The technical review was done by Robert Burton of the National Center for Education Statistics. Valuable assistance was also provided by the following reviewers: Gregory Spencer of the Bureau of the Census; Janet Pfleeger of the Bureau of Labor Statistics; Vance Grant of the Office of the Assistant Secretary, Office of Educational Research and Improvement; and William Fowler, Gayle Rogers, Mary Rollefson, Thomas Snyder, and William Sonnenberg of the National Center for Education Statistics. Computer support was provided by Clevie Gladney of the National Center for Education Statistics. Statistical assistance was provided by Mary Rochon and DeeAnn Wright of the National Center for Education Statistics.

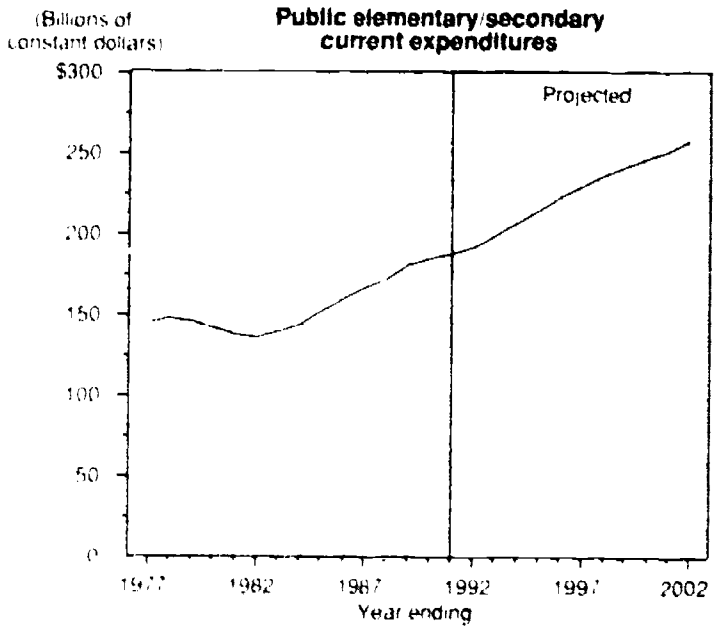
Several individuals outside the Center also contributed to the development of *Projections*. Jeannette Bernardo of HCR prepared the charts. The editing of the manuscript was done under the direction of Gerard Devlin and the cover was designed by Philip Carr, Office of the Assistant Secretary, Office of Educational Research and Improvement. System support was provided by LeeAnn Boykin, Jerry Fairbanks, and Larry Grantham of the Government Printing Office.

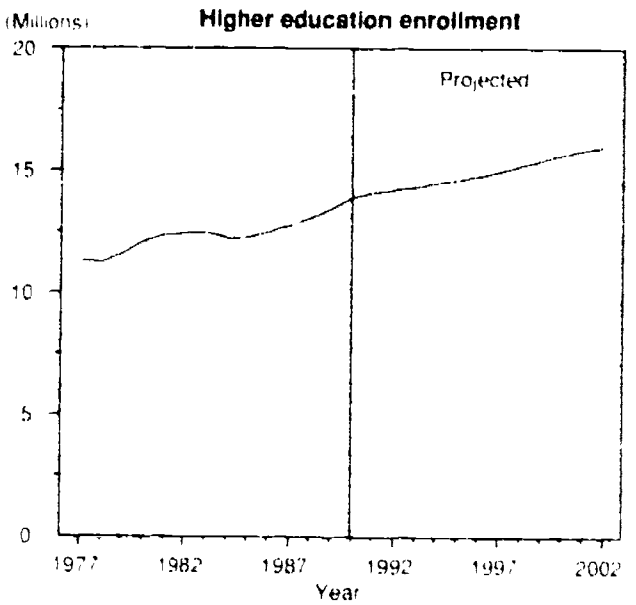
Figure 1
Summary of selected projected education statistics

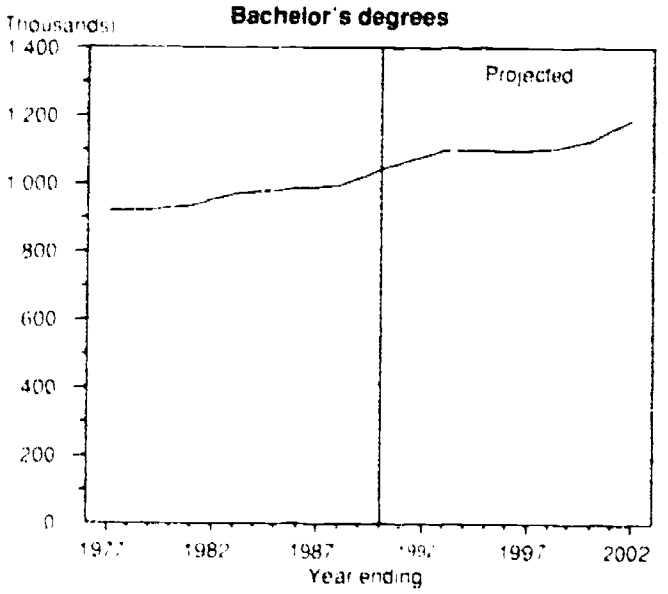












Highlights

National

Enrollment

- **Total public and private elementary and secondary enrollment is projected to increase between 1990 and the year 2002, surpassing the peak level attained in 1971.** From 1977 to 1984, total enrollment in public and private elementary and secondary schools decreased from 48.7 million to 44.9 million, a decrease of 8 percent. After 1984, total enrollment reversed its decline and increased to 46.2 million in 1990, a moderate increase of 3 percent. Total enrollment is projected to continue to increase to 51.8 million by 1998, surpassing the peak level of 51.3 million attained in 1971. Total enrollment is projected to increase further to 53.0 million by the year 2002, an increase of 15 percent from 1990. Past and projected trends in enrollment reflect changes in the 5- to 17-year-old population (table 1).

- **Over the projection period, enrollment in grades K–8 will continue to increase; enrollment in grades 9–12 will reverse its decline and rise.** From a low of 31.2 million in 1984, enrollment in grades K–8 increased to 33.8 million in 1990, an increase of 8 percent. This number is projected to continue to increase to 37.8 million by the year 2002, a further increase of 12 percent. From 15.6 million in 1977, enrollment in grades 9–12 decreased to a low of 12.4 million in 1990, a decrease of 20 percent. Enrollment in grades 9–12 is expected to rise to 15.2 million by the year 2002, an increase of 22 percent (table 1).

- **Both public and private schools will show enrollment increases over the projection period.** Enrollment in public elementary and secondary schools decreased from 43.6 million in 1977 to 39.2 million in 1984. After 1984, public school enrollment increased to 41.0 million in 1990. Enrollment in public schools is projected to continue to increase to 47.1 million by the year 2002, an increase of 15 percent. In 1990, an estimated 5.2 million students were enrolled in private elementary and secondary schools. Enrollment in private schools is projected to be 5.9 million by the year 2002, an increase of 14 percent from 1990 (table 1).

- **Increases in enrollments aggregated by organizational level of school are projected over the projection period.** Enrollment in elementary schools, excluding enrollment in grades 7 and 8 in secondary schools, decreased from 28.8 million in 1977 to 28.0 million in 1982. This number increased to 29.7 million in 1990. Elementary enrollment is expected to continue to increase through the year 2002, when it will reach 32.8 million, an increase of 10 percent from 1990. Enrollment in secondary schools, including 7th and 8th graders in secondary schools, decreased from 19.9 million in 1977 to 16.5 million in 1985. After 1985, secondary enrollment reversed its decline and increased to 17.1 million in 1989, before falling to 16.5 million in 1990. Over the projection period, this number is projected to rise to 20.2 million by the year 2002, an increase of 22 percent from 1990 (table 2).

- **Enrollment in institutions of higher education is projected to increase from 13.9 million in 1990 to 16.0 million by the year 2002, representing a slowdown in the rate of growth after 1990.** Between 1977 and 1983, higher education enrollment increased from 11.3 million to 12.5 million, an increase of 10 percent. In 1984 and 1985, higher education enrollment dropped and remained at 12.2 million. Then, it increased from 12.5 million in 1986 to an estimated 13.9 million in 1990, an increase of 14 percent from 1986. Higher education enrollment is projected to increase to 16.0 million by the year 2002, an increase of 15 percent from 1990, or an average annual growth rate of 1.2 percent for the middle alternative. This rate is less than the 1.6 percent average annual growth rate over the 1977–90 period. Under the low and high alternatives, higher education enrollment is projected to range between 15.2 million and 17.4 million by the year 2002. Over the projection period, this is a growth rate of 0.8 percent, or a 9 percent increase for the low alternative and an average annual growth rate of 1.9 percent, or a 25-percent increase for the high alternative (table 3).

- **Women are expected to increase their share of college enrollment to 56 percent by the year 2002.** Enrollment of women increased from 5.5 million in 1977 to an estimated 7.5 million in 1990, an increase of 37 percent. Under the middle alternative, this number is projected to increase to 9.0 million by the year 2002, an increase of 20 percent. Under the low and high alternatives, enrollment of women is projected to range between 8.7 million and 9.4 million by the year 2002. From 1977 to 1989, enrollment of men has fluctuated between 5.6 million and 6.2 million. In 1990, it was estimated at 6.1 million. Under the middle alternative, this number is projected to increase to 7.1 million by the year 2002, an increase of 10 percent. Under the low and high alternatives, enrollment of men is

expected to range between 6.6 million and 8.0 million by the year 2002 (table 3).

- **Increases in both full-time and part-time enrollments are projected over the projection period.** Full-time enrollment increased from 6.8 million in 1977 to an estimated 7.8 million in 1990, an increase of 15 percent. Under the middle alternative, full-time enrollment is projected to increase to 9.0 million by the year 2002, an increase of 15 percent. Under the low and high alternatives, full-time enrollment is expected to range between 8.6 million and 9.7 million by the year 2002. Part-time enrollment increased from 4.5 million in 1977 to an estimated 6.1 million in 1990, an increase of 36 percent. Under the middle alternative, this number is projected to increase to 7.0 million by the year 2002, an increase of 15 percent. Under the low and high alternatives, part-time enrollment is projected to range between 6.7 million and 7.7 million by the year 2002 (table 3).

- **Enrollments in public and private institutions of higher education are projected to increase over the projection period.** Enrollment in public institutions increased from 8.8 million in 1977 to an estimated 10.8 million in 1990, an increase of 23 percent. Under the middle alternative, public enrollment is expected to increase to 12.5 million by the year 2002, an increase of 15 percent. Under the low and high alternatives, public enrollment is expected to range between 11.9 million and 13.5 million by the year 2002. Enrollment in private institutions grew from 2.4 million in 1977 to an estimated 3.1 million in 1990, an increase of 27 percent. Under the middle alternative, private enrollment is projected to reach a high of 3.6 million by the year 2002, an increase of 15 percent. Under the low and high alternatives, private enrollment is projected to range between 3.4 million and 3.9 million by the year 2002 (table 3).

- **Enrollment increases are expected in both 4-year and 2-year institutions over the projection period.** Enrollment in 4-year institutions increased from 7.2 million in 1977 to an estimated 8.7 million in 1990, an increase of 21 percent. Under the middle alternative this number is projected to increase to 10.0 million by the year 2002, an increase of 15 percent. Under the low and high alternatives, enrollment in 4-year institutions is projected to range between 9.5 million and 10.9 million by the year 2002. Enrollment in 2-year institutions grew from 4.0 million in 1977 to an estimated 5.2 million in 1990, an increase of 28 percent. Under the middle alternative, this number is expected to increase to 6.0 million by the year 2002, an increase of 15 percent. Under the low and high alternatives, enrollment in 2-year institutions is projected to range between 5.7 million and 6.5 million by the year 2002 (tables 4 and 5).

- **Over the projection period, the enrollment of 18- to 24-year-olds will grow faster than the enrollment of students who are 25 years old and over.** The enrollment of 18- to 24-year-olds increased from 7.3 million in 1982 to an estimated 7.7 million in 1990. Under the middle alternative, this number is expected to rise to 8.9 million by the year 2002, a 16 percent increase from 1990. The enrollment of students who are 25 years old and over increased from 4.8 million in 1982 to an estimated 6.1 million in 1990. By the year 2002, this number is projected to increase to 6.9 million, an increase of 14 percent from 1990. Among college students of all ages, enrollment of women is expected to grow at a faster rate than men, reflecting higher enrollment rates for women over the projection period. Between 1990 and 2002, women who are 18- to 24-years old and 25 years old and over are projected to increase by 22 percent and 17 percent, respectively. On the other hand, men who are 18- to 24-years old and 25 years old and over are projected to increase at a slower rate, 9 percent and 11 percent, respectively, over the projection period (table 6).

- **Undergraduate, graduate, and first-professional enrollments are projected to increase over the projection period.** Undergraduate enrollment increased from 9.7 million in 1977 to an estimated 12.0 million in 1990, an increase of 23 percent. Under the middle alternative, undergraduate enrollment is expected to increase to 13.7 million by the year 2002, an increase of 15 percent. Under the low and high alternatives, undergraduate enrollment is expected to range between 13.1 million and 14.9 million by the year 2002. Graduate enrollment increased from 1.3 million in 1977 to an estimated 1.7 million in 1990, an increase of 26 percent. Under the middle alternative, graduate enrollment is expected to rise to 1.9 million by the year 2002, an increase of 16 percent. Under the low and high alternatives, graduate enrollment is projected to range between 1.8 million and 2.1 million by the year 2002. First professional enrollment increased from 251,000 in 1977 to an estimated 300,000 in 1990, an increase of 20 percent. Under the middle alternative, this number is projected to rise to 356,000 by the year 2002, an increase of 19 percent. Under the low and high alternatives, first-professional enrollment is expected to range between 320,000 and 402,000 by the year 2002 (tables 14, 17, and 20).

High School Graduates

- **The number of high school graduates is projected to increase by 2001–2002.** The number of high school graduates from public and private high schools decreased from 3.2 million in 1976–77 to 2.6 million in 1985–86. It then rose to 2.8 million in 1987–88. It

decreased to 2.6 million in 1989-90. Over the projection period, the number of graduates is expected to fluctuate and then decrease to 2.5 million by 1993–94. Thereafter, it will rise to 2.9 million by 2001–2002 (table 26).

- **Increases are expected in the number of graduates of both public and private high schools by 2001–2002.** The number of public high school graduates is projected to decrease from 2.3 million in 1989-90 to 2.2 million by 1993-94. By 2001-2002, the number will rise to 2.6 million. The number of private high school graduates, which were estimated at 268,000 in 1989-90, is projected to be 298,000 by 2001-2002 (table 26).

Earned Degrees Conferred

- **The number of associate degrees is projected to increase over the projection period as women continue to receive more associate degrees.** Between 1976-77 and 1982–83, the number of associate degrees increased from 406,000 to 456,000 and then decreased to 445,000 in 1989-90. Under the middle alternative, this number is expected to increase to 539,000 by 2001-2002, reflecting the increase in the number of degrees awarded to women. Under the low and high alternatives, associate degrees are projected to range between 510,000 and 576,000 in 2001-2002. Under the middle alternative, the number of associate degrees awarded to men will remain around 200,000 for most of the 1990s and then increase to 219,000 by 2001-2002, an increase of 18 percent from 1989-90. Under the low and high alternatives, associate degrees awarded to men are projected to range between 205,000 and 238,000. Under the middle alternative, the number awarded to women is projected to increase from 260,000 in 1989-90 to 320,000 by 2001-2002, an increase of 23 percent. Under the low and high alternatives, associate degrees awarded to women are projected to range between 305,000 and 338,000 (table 27).

- **The number of bachelor's degrees is projected to rise to 1.2 million over the projection period.** Between 1976-77 and 1989-90, the number of bachelor's degrees increased from 919,000 to 1,043,000, an increase of 13 percent. Under the middle alternative, this number is expected to increase to 1,189,000 by 2001-2002, an increase of 14 percent. Under the low and high alternatives, bachelor's degrees are projected to range between 1,130,000 and 1,277,000. The number of bachelor's degrees awarded to men declined from 496,000 in 1976-77 to 483,000 in 1989-90, a decrease of 2 percent. Under the middle alternative, this number is expected to fluctuate over most of the projection period and then increase to 528,000 by 2001-2002, an increase of 9 percent from 1989-90. Under the low and high alternatives, bachelor's degrees awarded to men are expected to range between 501,000 and 571,000. The number of bachelor's degrees awarded to women increased from 424,000 in 1976-77 to 558,000 in 1989-90, a increase of 32 percent. Under the middle alternative, this number is expected to increase over the projection period to 661,000 by 2001-2002, an increase of 18 percent. Under the low and high alternatives, bachelor's degrees awarded to women are projected to range between 629,000 and 706,000 by 2001-2002 (table 28).

- **Under the middle alternative, women will continue to receive more master's degrees than those awarded to men over the projection period.** The number of master's degrees peaked at 317,000 in 1976-77 and then fell to 284,000 in 1983–84. Since then, master's degrees have increased to 319,000 in 1989–90. Under the middle alternative, this trend is projected to continue, reaching 383,000 by 2001-2002, an increase of 20 percent. Under the low and high alternatives, the number of master's degrees is projected to range between 342,000 and 430,000. Under the middle alternative, the number of degrees awarded to men is projected to increase from 149,000 in 1989-90 to 184,000 in 2001–2002, an increase of 24 percent. Under the low and high alternatives, master's degrees awarded to men are projected to range between 152,000 and 223,000. Under the middle alternative, the number of master's degrees awarded to women is expected to increase by 17 percent, from 170,000 in 1989-90 to 199,000 by 2001-2002. Under the low and high alternatives, master's degrees awarded to women are expected to range between 190,000 and 207,000 (table 29).

- **The number of doctor's degrees awarded to women is projected to increase over the projection period.** Amid fluctuations in the number of degrees conferred, doctor's degrees decreased between 1976-77 and 1981-82, from 33,200 to 32,700. Since then, this number has increased to 38,000 in 1989-90. Under the middle alternative, doctor's degrees are expected to increase to 41,400 by 2001-2002, an increase of 9 percent. Under the low and high alternatives, the number of doctor's degrees is projected to range between 36,700 and 48,000. Under the middle alternative, the number of doctor's degrees awarded to men is projected to decrease slightly from 24,000 in 1989-90 to 22,400 in 2001-2002, a decrease of 7 percent. Under the low and high alternatives, doctor's degrees awarded to men are projected to range between 17,900 and 28,800. Under the middle alternative, the number of doctor's degrees awarded to women is expected to increase from 14,000 to 19,000 over the projection

period, an increase of 36 percent. Under the low and high alternatives, doctor's degrees awarded to women are projected to range between 18,800 and 19,200 (table 30).

- **First-professional degrees are projected to increase over the projection period.** The number of first-professional degrees increased from 64,400 in 1976–77 to 75,100 in 1984–85. Since then, this number declined to 71,000 in 1989–90. Under the middle alternative, first-professional degrees are projected to increase to 94,400 by 2001–2002, an increase of 33 percent. Under the low and high alternatives, first-professional degrees are expected to range between 83,300 and 106,300. Under the middle alternative, the number of first-professional degrees awarded to men is projected to increase from 43,000 in 1989–90 to 57,000 by 2001–2002, an increase of 33 percent. Under the low and high alternatives, first-professional degrees awarded to men are projected to range between 50,100 and 65,700. Under the middle alternative, first-professional degrees awarded to women are projected to increase from 28,000 in 1989–90 to 37,400 by 2001–2002, an increase of 34 percent. Under the low and high alternatives, first-professional degrees awarded to women are expected to range between 33,200 and 40,600 (table 31).

Classroom Teachers

- **Following a decrease in 1992, the number of classroom teachers is projected to rise over the projection period.** Between 1981 and 1990, classroom teachers in public and private elementary and secondary schools increased from 2.44 million to 2.74 million, an increase of 13 percent. Under the middle alternative, this number is expected to increase to 2.83 million in 1991 and then fall slightly to 2.79 million in 1992 before rising to 3.25 million by the year 2002, an increase of 19 percent from 1990, or an average annual growth rate of 1.4 percent. Under the low and high alternatives, the number of classroom teachers is expected to range between 3.17 million and 3.35 million by the year 2002 (table 32).

- **Both elementary and secondary teachers are projected to increase over the projection period.** Elementary classroom teachers increased from 1.38 million in 1981 to 1.66 million in 1989. Then, the number of elementary teachers decreased slightly to 1.63 million in 1990. Under the middle alternative, this number is projected to remain at 1.63 million in 1991, before increasing to 1.90 million by the year 2002, an increase of 17 percent from 1990, or an average annual growth rate of 1.3 percent. Under the low and high alternatives, elementary teachers are projected to range between 1.84 million and 1.97 million by the year 2002. Secondary classroom teachers increased from 1.04 million in 1982 to 1.11 million in 1990. Under the middle alternative, secondary classroom teachers will increase to 1.19 million in 1991 and then decrease to 1.15 million in 1992 before rising to 1.35 million by the year 2002, an increase of 22 percent, or an average annual growth rate of 1.6 percent. Under the low and high alternatives, secondary teachers are projected to range between 1.32 million and 1.38 million (table 32).

- **Both public and private classroom teachers are projected to increase over the projection period.** Under the middle alternative, classroom teachers in public schools are projected to increase from 2.39 million in 1990 to 2.46 million in 1991, and then fall slightly to 2.43 million in 1992. Following this decrease, public school teachers are projected to increase to 2.84 million by the year 2002. Under the low and high alternatives, public school teachers are projected to range between 2.76 million and 2.92 million by the year 2002. Classroom teachers in private schools numbered 353,000 in 1990. Under the middle alternative, this number will be 417,000 by the year 2002. Under the low and high alternatives, private school teachers are expected to range between 405,000 and 430,000 (table 32).

- **Under the middle alternative, the pupil-teacher ratio in elementary schools is projected to rise through 1992 and then fall slightly for the remainder of the projection period; the pupil-teacher ratio in secondary schools will rise until 1997 and then decline slightly.** Since 1977, the pupil-teacher ratio in elementary schools has decreased from 20.9 to 17.3 in 1989. Then, the ratio increased to 18.2 in 1990. Under the middle alternative, this ratio is projected to continue to increase to 18.5 in 1992, and then decline to 17.2 by the year 2002. Under the low and high alternatives, this ratio is expected to range between 16.6 and 17.8 by the year 2002. For secondary schools, the pupil-teacher ratio decreased from 17.9 in 1977 to 15.7 in 1987. It increased to 16.0 and remained at that level in 1988 and 1989. Then, this ratio declined to 14.9 in 1990. Under the middle alternative, this ratio will rise to 15.2 in 1997, before falling to 15.0 by the year 2002. Under the low and high alternatives, the pupil-teacher ratio in secondary schools is projected to range between 14.7 and 15.3 (table 33).

Expenditures of Public Elementary and Secondary Schools

- **Current expenditures are forecast to continue increasing through to 2001–2002.** Between 1976–77 and 1990–91, current expenditures are estimated to have increased 30 percent in constant dollars. Current

expenditures are seen continuing this trend, increasing 37 percent between 1990–91 and 2001–2002 under the middle-high alternative. Under the low alternative, current expenditures are projected increase 31 percent and under the high alternative, current expenditures are projected to increase 45 percent (table 34).

- **Increases in current expenditures per pupil are also forecast for the period 1990–91 to 2001–2002.** The period from 1976–77 until 1990–91 saw current expenditures per pupil in average daily attendance (ADA) increase an estimated 40 percent in constant dollars. Under the middle-high alternative, current expenditures per pupil are forecast to increase another 20 percent between 1990–91 and 200–12002. Under the low and high alternatives, the increase in current expenditures is projected to range between 15 and 27 percent. Current expenditures per pupil are forecast to increase less rapidly than total current expenditures due to the increase projected for the number of pupils (table 34).

- **Further increases in teacher salaries are forecast.** After a period of declining salaries (teacher salaries in constant dollars fell 10 percent from 1976–77 to 1980–81), teacher salaries rose constantly from 1981–82 to 1989–90. During that time, teacher salaries in constant dollars grew an estimated 21 percent. With the present recession, teacher salaries have been estimated to have fallen slightly in real terms from 1989–90 to 1990–91. As the current trend of increasing enrollments continues and as the economy begins increasing again, it is forecast that teacher salaries will also begin increasing. Teacher salaries are projected to increase 18 percent between 1990–91 and 2001–2002 under the middle-high alternative. A 14-percent increase is projected under the low alternative and a 22-percent increase is projected under the high alternative (table 36).

State-Level

Public Elementary and Secondary Enrollment

- **Public elementary and secondary school enrollment (kindergarten through grade 12) is expected to increase between 1990 and the year 2002, but these increases will vary across the Nation.** Enrollment will increase most rapidly in the Northeastern states, where total enrollment is expected to rise 22 percent. Enrollment in the Western region is projected to increase by 18 percent. The Southern region is expected to rise by 15 percent, while the Midwestern region is projected to increase by 7 percent (tables 37 and 38).

- **Five states in the Western region are projected to show sizable increases in public school enrollment between 1990 and the year 2002.** Sizable increases are expected in Alaska (30 percent), Arizona (35 percent), California (24 percent), Hawaii (47 percent), and New Mexico (35 percent). Decreases are expected in Idaho (7 percent), Montana (9 percent), Oregon (1 percent), and Wyoming (15 percent). Many states in the Northeastern region are expected to show large increases in public school enrollment between 1990 and 2002. Increases are expected in Connecticut (18 percent), Maine (23 percent), Massachusetts (21 percent), New Hampshire (46 percent), New Jersey (40 percent), and Vermont (21 percent). In the Southern region, increases in public school enrollment are expected in Delaware (29 percent), District of Columbia (25 percent), Florida (32 percent), Georgia (27 percent), Maryland (38 percent), North Carolina (32 percent), and Virginia (44 percent). Sizable decreases are projected in Oklahoma (17 percent) and West Virginia (12 percent) over the projection period. In the Midwestern region, increases are projected in Illinois (19 percent), Michigan (11 percent), Missouri (15 percent), and South Dakota (9 percent). Decreases are expected in Iowa (12 percent), Nebraska (8 percent), North Dakota (10 percent), and Wisconsin (3 percent) (tables 37 and 38).

- **Changes in elementary enrollment are projected to vary across the Nation.** Public school elementary enrollment in kindergarten through grade 8 is expected to increase 12 percent between 1990 and the year 2002. Enrollment is projected to rise by 17 percent in the Northeastern region, 14 percent in the Western region, 13 percent in the Southern region, and 5 percent in the Midwestern region. Increases in elementary enrollment are expected to occur in the majority of states across the Nation. Sizable increases in elementary enrollment are projected for Alaska (22 percent), Arizona (23 percent), Delaware (27 percent), Florida (30 percent), Hawaii (27 percent), Maine (23 percent), Maryland (32 percent), New Hampshire (38 percent), New Jersey (37 percent), North Carolina (30 percent), and Virginia (42 percent) over the projection period (tables 39 and 40).

- **Increases in high school enrollment are projected across the Nation.** Public high school enrollment in grades 9 through 12 is projected to increase 23 percent

between 1990 and 2002. Increases are expected in all regions of the Nation. The Northeastern region is projected to rise by 33 percent. A 29-percent increase is expected for the Western region. The Southern and Midwestern regions are expected to increase 21 percent and 11 percent, respectively. Sizable increases are expected in Arizona (83 percent), California (30 percent), District of Columbia (99 percent), Florida (37 percent), Hawaii (102 percent), Maryland (58 percent), New Hampshire (69 percent), New Jersey (48 percent), New Mexico (75 percent), North Carolina (38 percent), and Virginia (50 percent) over the projection period (tables 41 and 42).

Public High School Graduates

- **Growth in the number of graduates from public schools will vary by region.** The number of public high school graduates is projected to increase 11 percent between 1989–90 and 2001–2002. Across regions, the West is expected to rise by 36 percent. The South is projected to grow by 7 percent. The Midwest and Northeast are expected to increase by 4 percent and 3 percent, respectively, over the projection period (tables 43 and 44).

- **Western States are projected to show the largest increases over the projection period.** Between 1989–90 and 2001–2002, most of the states in the Western region are projected to show increases in the number of public high school graduates. Sizable increases are expected in Arizona (47 percent), California (48 percent), Nevada (77 percent), and Washington (33 percent). In the Southern region, Florida is projected to rise by 40 percent. Other increases are projected for Georgia (26 percent) and Maryland (27 percent). In the Midwest, growth is expected in Kansas (18 percent), Minnesota (25 percent), and South Dakota (12 percent). New Hampshire in the Northeast is projected to increase 27 percent over the projection period. Other increases are projected for Rhode Island (17 percent) and Vermont (10 percent). Most of the remaining Northeastern states are expected to show only slight increases over the projection period, less than 5 percent (tables 43 and 44).

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Introduction

Guide to This Edition

This edition of *Projections of Education Statistics to 2002* provides projections for key education statistics. This edition includes statistics on enrollment, graduates, instructional staff, and expenditures in elementary and secondary schools and institutions of higher education. For the Nation, the tables, figures, and text contain data on enrollment, teachers, graduates, and expenditures for the past 14 years and projections to the year 2002. For the 50 States and the District of Columbia, the tables, figures, and text contain data on projections of public school elementary and secondary enrollment and public high school graduates to the year 2002. Similar methodologies were used to obtain a uniform set of projections for the 50 States and District of Columbia. These projections are further adjusted to agree with the national projections of public elementary and secondary school enrollment and public high school graduates appearing in this report. Appendix A describes the methodology and assumptions used to develop the projections. Appendix B contains tables of supplementary data. A table of mean absolute percentage errors of selected state projections is provided in appendix C. Data sources are presented in appendix D. Appendix E is a glossary of terms.

Changes from Past Edition

Format

Unlike *Projections of Education Statistics to 2001: An Update* which, consisted principally of tables of projections of key education statistics, this edition includes chapters of text, figures, and tables of projections. It also includes descriptions of the methodologies used to develop the projections. There is a new section on developments in projecting education statistics. This section presents new projections of higher education enrollment by race/ethnicity.

Exclusions

Projections of demand for new hiring of classroom teachers are excluded from this edition. With the release of data on teacher attrition and sources of teacher supply from the Schools and Staffing Survey (SASS) of NCES, the practice of using various assumptions to develop projections of the demand for new hiring of classroom teachers will be discontinued. The SASS data will be used for future analyses of this variable. Presently, data from SASS are available for only one time period and are insufficient for making projections. NCES will continue to project the total demand for classroom teachers. Also excluded from this edition are projections of instructional faculty and expenditures for institutions of higher education. Before projections of these statistics can be prepared, work needs to be done in developing time series from existing and new NCES data sources.

Alternative Population Projections

In previous editions of *Projections*, projections of key education statistics were developed using the series 14 or middle series population projections developed by the Bureau of the Census. Since these population projections were prepared in 1987, the assumptions underlying projections of fertility and net immigration have not prevailed. New population projections based on the 1990 Census are not yet available. Therefore, the projections of the education statistics appearing in this edition are not based on the 1990 Census data.

Instead, the projections of education statistics in this edition were developed using the Bureau of the Census series 18 population projections which are based on high fertility and high immigration assumptions. Consequently, toward the end of the projection period, the projected levels of enrollments and earned degrees in this edition will be somewhat higher than projections based on the series 14 or the middle series population projections

Limitations of Projections

Projections of time series usually differ from the reported data due to errors from many sources. This is because of the inherent nature of the statistical universe from which the basic data are obtained and the properties of projection methodologies, which depend on the validity of many assumptions. Therefore, alternative projections are shown for some statistical series to denote the uncertainty involved in making projections. These alternatives are not statistical confidence limits, but instead represent judgments made by the authors as to reasonable upper and lower bounds. Alternative projections are presented for higher education enrollment, classroom teachers, earned degrees conferred, and expenditures of public elementary and secondary schools. Although alternative projections were not developed for national and state-level projections of public school enrollments and public high school graduates, an analysis of projection errors (differences between actual and projected numbers) for the past 5 years was conducted. The mean absolute percentage error (MAPE) was used to measure the accuracy of past projections. To compute the MAPE, an average of the absolute values of the 1-, 2-, 3-, 4-, and 5-year-out projection errors was calculated.

National Projections

Chapter 1

Elementary and Secondary Enrollment

Between 1990 and the year 2002, enrollment will increase in elementary and secondary schools. The primary reason for the increase is the rising number of annual births since 1977 —sometimes referred to as the baby echo. Over the next 12 years, this surge of births will cause increases in the school-age population (5- to 17-year-olds), inclusive of the 5- to 13-year-old population and the 14- to 17-year-old population (figures 2 and 3). These population increases, which began in the early 1980s, are expected to continue the growth in elementary enrollment and begin the increase in secondary enrollment in the 1990s and beyond. The resulting enrollment growth will surpass the peak level reached in 1971. School districts must explore new ways to meet the challenges facing them as they prepare for increasing numbers of elementary and secondary students each year in the 1990s and beyond. In addition to finding new resources to meet the expenses of educating a large number of students, many districts will need to build more schools to accommodate these students. But, the increase in enrollment will vary across the Nation. For a discussion of changes in public elementary and secondary enrollment by state over the projection period, see chapter 7 of this report.

Elementary and Secondary Enrollment

Reflecting the decline in the 5- to 17-year-old population, total enrollment in public and private elementary and secondary schools decreased from 48.7 million in 1977 to 44.9 million in 1984, a decrease of 8 percent (table 1 and figure 4). After reaching a low of 44.9 million in 1984, total enrollment reversed its downward trend in response to an increase in the 5- to 17-year-old population and rose to 46.2 million in 1990, an increase of 3 percent. Total enrollment is projected to continue to increase to 51.8 million in 1998, surpassing the peak level of 51.3 million attained in 1971. Total enrollment is projected to increase further to 53.0 million by the year 2002, an increase of 15 percent from 1990.

Enrollment, by Control of School

Enrollment in public elementary and secondary schools decreased from 43.6 million in 1977 to 39.2 million in 1984, a decrease of 10 percent (figure 5). Since then, enrollment in public schools has increased to 41.0 million in 1990, an increase of 5 percent. Enrollment in public schools is projected to increase to 47.1 million by the year 2002, an increase of 15 percent.

Since the mid-1970s, enrollment in private elementary and secondary schools has fluctuated between 5.0 million and 5.7 million. A sample survey of private schools conducted by NCES in 1990 estimated that 5.2 million students were enrolled in private elementary and secondary schools. Enrollment in private schools is projected to increase to around 5.9 million by the year 2002, an increase of 14 percent from 1990.

Projections of enrollments in public elementary and secondary schools are based on projected grade retention rates. The retention rates for grades 2 through 10 are all close to 100 percent. Rates for grade 6 to grade 7 and grade 8 to grade 9 are significantly over 100 percent. Traditionally, these are the grades in which large numbers of private elementary students transfer to public secondary schools. The retention rates for grades 11 to 12 are about 90 percent. The grade retention rates are assumed to be constant throughout the projection period.

Projections of private school enrollment were derived using public school enrollment data for 1990. The ratio of private school enrollment to public school enrollment was calculated for grades K–8 and 9–12. These ratios were held constant over the projection period and applied to projections of public school enrollment for grades K–8 and 9–12 to yield projections of private school enrollment. This method assumes that the future pattern in the trend of private school enrollment will be the same as that in public school enrollment. However, a number of factors could alter the assumption of constant ratios over the projection period. Because of the lack of consistent time series data on private school enrollment, it was assumed that the 1990 ratio would remain constant over time.

Enrollment, by Grade Group

Between 1977 and 1984, enrollment decreased in grades K–8 and 9–12. Enrollment in grades K–8 fell from 33.1 million to 31.2 million, a decrease of 6 percent. Enrollment in grades 9–12 dropped from 15.6 million to 13.7 million, a decrease of 12 percent. Between 1984 and 1990, enrollment trends in elementary and secondary schools for grades K–8 and 9–12 differed as enrollment increased in grades K–8 and continued to decline in grades 9–12. Enrollment in grades K–8 increased from 31.2 million in 1984 to 33.8 million in 1990, an increase

of 8 percent. In contrast, enrollment in grades 9–12 decreased from 13.7 million to 12.4 million over the same period, a decrease of 9 percent. By the year 2002, enrollment in grades K–8 is projected to increase by 12 percent to 37.8 million and enrollment in grades 9–12 is expected to rise by 22 percent to 15.2 million. Since enrollment rates for the school-age population are nearly 100 percent for elementary grades and junior-high grades or close to 90 percent for high school grades, the historical and projected patterns of decline and growth in enrollment in grades K–8 and grades 9–12 reflect changes in the sizes of the 5- to 13-year-old population and the 14- to 17-year-old population.

Enrollment by grade group in public elementary and secondary schools shows trends similar to those of total enrollment. Enrollment in grades K–8 of public schools decreased from 29.3 million in 1977 to 26.9 million in 1984. It then increased to 29.7 million in 1990. Enrollment in grades K–8 of public schools is projected to increase to 33.2 million by the year 2002, an increase of 12 percent. Enrollment in grades 9–12 of public schools decreased from 14.2 million in 1977 to 11.2 million in 1990. Thereafter, 9–12 enrollment is expected to increase to 13.8 million by the year 2002, an increase of 22 percent.

Enrollment by grade group in private elementary and secondary schools will show patterns similar to public school enrollment over the projection period by virtue of the private school enrollment projection methodology, which assumes private school enrollment will reflect trends in public school enrollment. Enrollment in grades K–8 of private schools is projected to increase from 4.1 million in 1990 to 4.5 million by the year 2002, an increase of 12 percent. Enrollment in grades 9–12 of private schools is projected to increase from 1.1 million in 1990 to 1.4 million by the year 2002, an increase of 22 percent.

Enrollment, by Organizational Level

Enrollments may also be aggregated by the level of school attended by students. The reported enrollment in elementary schools is smaller than enrollment in kindergarten through grade 8 because it excludes enrollment in grades 7 and 8 in secondary schools. Enrollment in elementary schools decreased from 28.8 million in 1977 to 28.0 million in 1982, a decrease of 3 percent (table 2). This number increased by 6 percent to 29.7 million in 1990. Enrollment in elementary schools is expected to continue to increase to 32.8 million by the year 2002, an increase of 10 percent. Enrollment in secondary schools, including 7th and 8th graders in secondary schools, decreased from 19.9 million in 1977 to 16.5 million in 1985, a decrease of 17 percent. Then, this number increased to 17.1 million in 1989, before dropping to 16.5 million in 1990. Enrollment in secondary schools is projected to rise to 20.2 million by the year 2002, an increase of 22 percent.

Figure 2

5- to 17-year-old population, with projections: 1977 to 2002

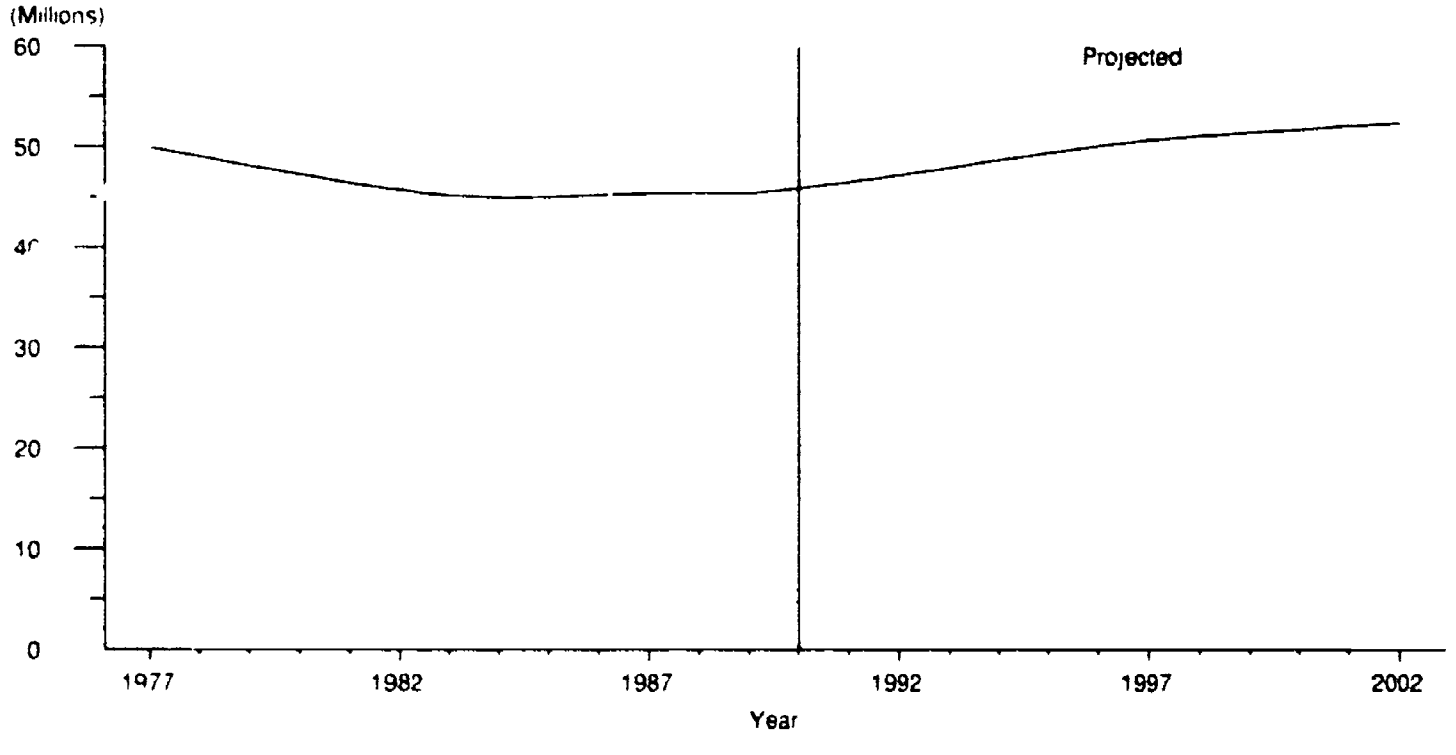


Figure 3

School-age populations, with projections: 1977 to 2002

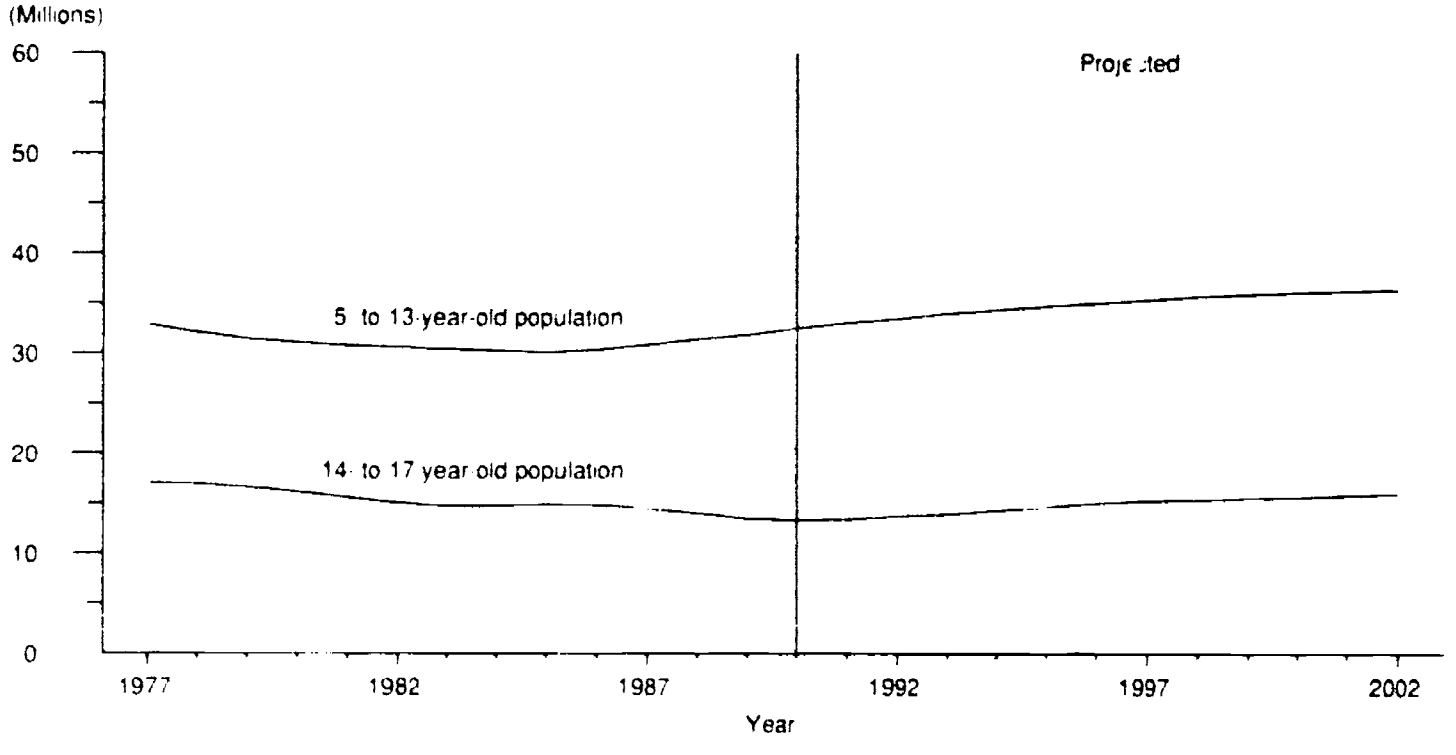


Figure 4

Enrollment in elementary and secondary schools, by grade level, with projections: Fall 1977 to fall 2002

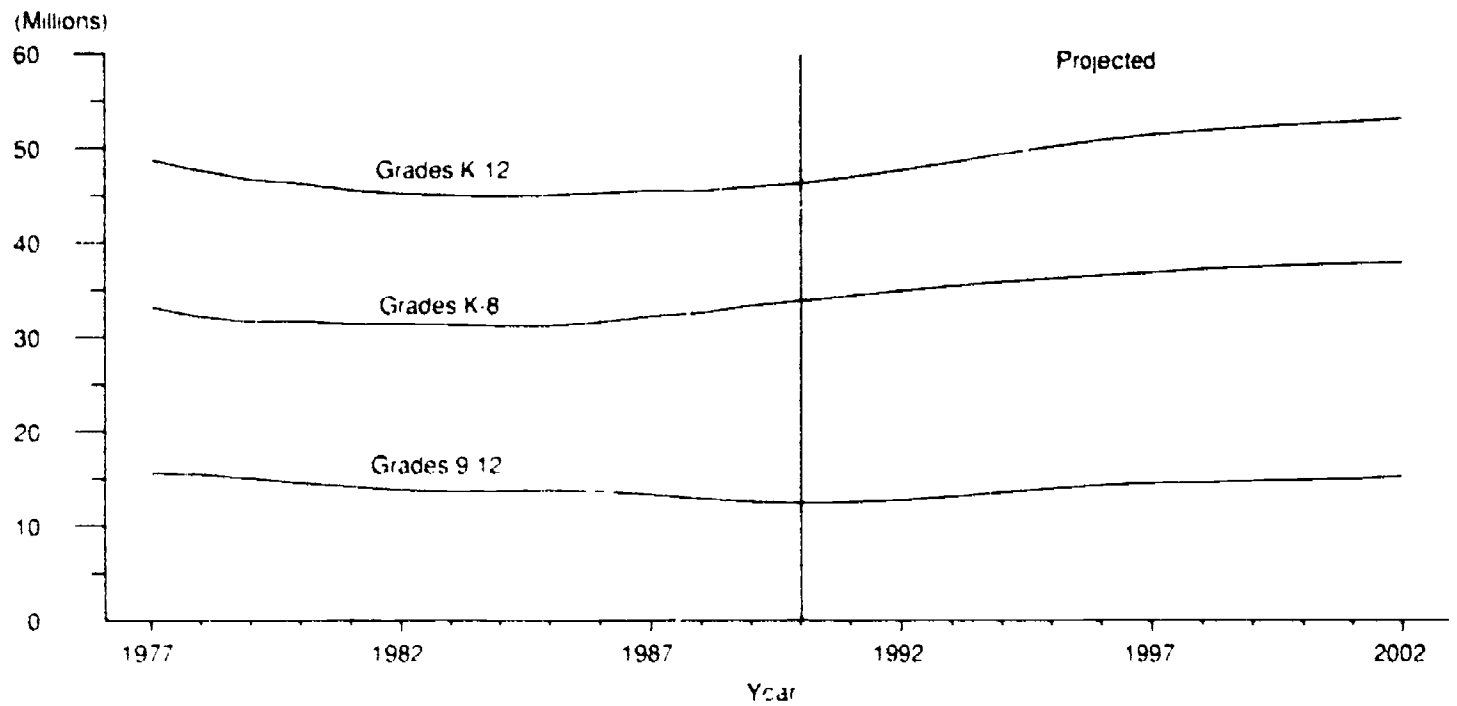


Figure 5

Enrollment in elementary and secondary schools, by control of institution, with projections: Fall 1977 to fall 2002

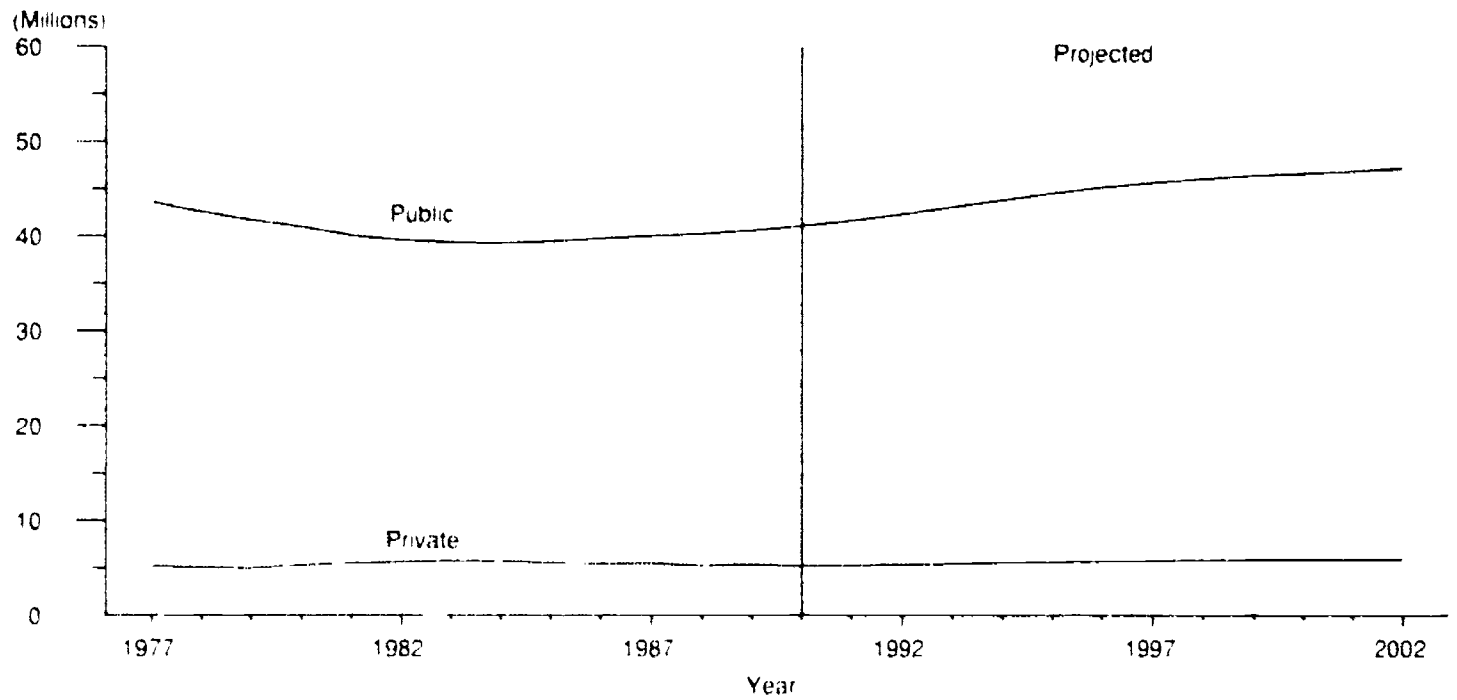


Table 1.—Enrollment in grades K–8[1] and 9–12 of elementary and secondary schools, by control of institution, with projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total			Public			Private		
	K–12[1]	K–8[1]	9–12	K–12[1]	K–8[1]	9–12	K–12[1]	K–8[1]	9–12
1977	48,717	33,133	15,583	43,577	29,336	14,240	5,140	3,797	1,343
1978	47,636	32,157	15,478	42,550	28,425	14,125	5,086	3,732	1,353
1979	46,645	31,631	15,014	41,645	27,931	13,714	[2]5,000	3,700	1,300
1980	46,249	31,669	14,581	40,918	27,677	13,242	5,331	3,992	1,339
1981	45,522	31,370	14,152	40,022	27,270	12,752	[2]5,500	4,100	1,400
1982	45,166	31,358	13,807	39,566	27,158	12,407	[2]5,600	4,200	1,400
1983	44,967	31,294	13,674	39,252	26,979	12,274	5,715	4,315	1,400
1984	44,908	31,200	13,708	39,208	26,900	12,308	[2]5,700	4,300	1,400
1985	44,979	31,225	13,754	39,422	27,030	12,392	5,557	4,195	1,362
1986	45,205	31,536	13,669	39,753	27,420	12,333	[2]5,452	4,116	1,336
1987	45,487	32,164	13,323	40,008	27,932	12,076	[2]5,479	4,232	1,247
1988	45,430	32,539	12,892	40,189	28,503	11,686	[2]5,241	4,036	1,206
1989	45,881	33,320	12,562	40,526	29,158	11,369	[2]5,355	4,162	1,193
1990[3]	46,221	33,808	12,413	41,026	29,742	11,284	5,195	4,066	1,129
				Projected					
1991	46,841	34,313	12,529	41,575	30,186	11,389	5,266	4,127	1,140
1992	47,601	34,855	12,746	42,250	30,663	11,587	5,351	4,192	1,159
1993	48,410	35,341	13,069	42,971	31,091	11,880	5,439	4,250	1,189
1994	49,279	35,751	13,528	43,749	31,451	12,298	5,530	4,300	1,230
1995	50,054	36,127	13,927	44,442	31,782	12,660	5,612	4,345	1,267
1996	50,759	36,452	14,307	45,074	32,07[illegible]	13,006	5,685	4,384	1,301
1997	51,331	36,765	14,567	45,585	32,343	13,242	5,746	4,422	1,325
1998	51,750	37,126	14,624	45,955	32,661	13,294	5,795	4,465	1,330
1999	52,110	37,333	14,777	46,276	32,843	13,433	5,834	4,490	1,344
2000	52,406	37,548	14,858	46,539	33,032	13,507	5,867	4,516	1,351
2001	52,679	37,707	14,972	46,782	33,172	13,610	5,897	4,535	1,362
2002	52,996	37,790	15,206	47,068	33,245	13,823	5,928	4,545	1,383

[1] Includes most kindergarten and some nursery school enrollment.
[2] Estimated by NCES.
[3] Estimate

NOTE: Some data have been revised from previously published figures. Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of Public Elementary and Secondary Schools*; Common Core of Data surveys; "Selected Public and Private Elementary and Secondary Education Statistics," *NCES Bulletin*, October 23, 1979; "Private Elementary and Secondary Education, 1983: Enrollment, Teachers, and Schools," *NCES Bulletin*, December 1984; 1985 Private School Survey; "Key Statistics for Private Elementary and Secondary Education: School Year 1988–89," *Early Estimates*, "Key Statistics for Private Elementary and Secondary Education: School Year 1989–90," *Early Estimates*; and "Key Statistics for Public and Private Elementary and Secondary Education: School Year 1990–91," *Early Estimates*. (This table was prepared April 1991.)

Table 2.—Enrollment in elementary and secondary schools, by organizational level and control of institution, with projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total			Public			Private		
	K-12[1]	Elementary	Secondary	K-12[1]	Elementary	Secondary	K-12[1]	Elementary	Secondary
1977	48,717	28,788	19,929	43,577	24,991	18,586	5,140	3,797	1,343
1978	47,636	28,749	18,887	42,550	25,017	17,534	5,086	3,732	1,353
1979	46,645	28,591	18,054	41,645	24,891	16,754	[2]5,000	3,700	1,300
1980	46,249	28,212	18,037	40,918	24,220	16,698	5,331	3,992	1,339
1981	45,522	28,174	17,348	40,022	24,074	15,948	[2]5,500	4,100	1,400
1982	45,166	28,023	17,142	39,566	23,823	15,742	[2]5,600	4,200	1,400
1983	44,967	28,264	16,703	39,252	23,949	15,303	5,715	4,315	1,400
1984	44,908	28,395	16,513	39,208	24,095	15,113	[2]5,700	4,300	1,400
1985	44,979	28,470	16,509	39,422	24,275	15,147	5,557	4,195	1,362
1986	45,205	28,266	16,939	39,753	24,150	15,603	[2]5,452	4,116	1,336
1987	45,487	28,537	16,950	40,008	24,305	15,703	[2]5,479	4,232	1,247
1988	45,430	28,451	16,980	40,189	24,415	15,774	[2]5,241	4,036	1,206
1989	45,881	28,782	17,099	40,526	24,620	15,906	[2]5,355	4,162	1,193
1990[3]	46,221	29,680	16,541	41,026	25,614	15,412	5,195	4,066	1,129
				Projected					
1991	46,841	30,070	16,772	41,575	25,943	15,632	5,266	4,127	1,140
1992	47,601	30,442	17,159	42,250	26,250	16,000	5,351	4,192	1,159
1993	48,410	30,800	17,610	42,971	26,550	16,421	5,439	4,250	1,189
1994	49,279	31,130	18,149	43,749	26,830	16,919	5,530	4,300	1,230
1995	50,054	31,460	18,594	44,442	27,115	17,327	5,612	4,345	1,267
1996	50,759	31,817	18,942	45,074	27,433	17,641	5,685	4,384	1,301
1997	51,331	32,081	19,251	45,585	27,659	17,926	5,746	4,422	1,325
1998	51,750	32,364	19,386	45,955	27,899	18,056	5,795	4,465	1,330
1999	52,110	32,551	19,559	46,276	28,061	18,215	5,834	4,490	1,344
2000	52,406	32,691	19,715	46,539	28,175	18,364	5,867	4,516	1,351
2001	52,679	32,764	19,915	46,782	28,229	18,553	5,897	4,535	1,362
2002	52,996	32,783	20,213	47,068	28,238	18,830	5,928	4,545	1,383

[1] Includes most kindergarten and some nursery school enrollment.
[2] Estimated by NCES.
[3] Estimate.

NOTE: Some data have been revised from previously published figures. Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of Public Elementary and Secondary Schools*; Common Core of Data surveys; "Selected Public and Private Elementary and Secondary Education Statistics," *NCES Bulletin*, October 23, 1979; "Private Elementary and Secondary Education, 1983: Enrollment, Teachers, and Schools," *NCES Bulletin*, December 1984; 1985 Private School Survey; "Key Statistics for Private Elementary and Secondary Education: School Year 1988-89," *Early Estimates*; "Key Statistics for Private Elementary and Secondary Education: School Year 1989-90," *Early Estimates*; and "Key Statistics for Public and Private Elementary and Secondary Education: School Year 1990-91," *Early Estimates*. (This table was prepared April 1991.)

Chapter 2

Higher Education Enrollment

Enrollment in institutions of higher education* is expected to rise over the projection period. The growth is due in part to the rising enrollment rates of the younger age cohorts for men and women and those of the older age cohorts for women. Changes in college-age populations will also affect enrollment levels over the next 12 years (figures 6 and 7). Over the projection period, the 25- to 29-year-old population is projected to decrease by 18 percent, and the 30- to 34-year-old population will decline by 11 percent. But, the resumption of annual population increases in the 18- to 24-year-old population beginning in 1996 and the continued growth in the 35 years and over population will offset the loss of students from the 25- to 29-year-old and 30- to 34-year-old populations, and contribute to the increases in enrollment levels in the 1990s and beyond.

Higher education enrollment projections were based on projected enrollment rates, by age and sex, which were then applied to population projections by age and sex developed by the Bureau of the Census. New population projections based on the 1990 Census are not yet available. Therefore, the series 18 population projections, which assume high fertility and net immigration, were used. The enrollment rates were projected by taking into account the most recent trends, as well as the effects of economic conditions and demographic changes on the enrollment rates of the younger age cohorts.

Three alternative projections of enrollment in institutions of higher education were developed to indicate the range of possible outcomes. The middle alternative assumes that the enrollment rates of most of the 18- to 24-year-olds will increase over the projection period, while those for older age groups are expected to remain constant at levels consistent with the most recent enrollment rates for men and increase slightly for women. In particular, the enrollment rates of 18-, 19-, and 20-year-old men by attendance status were projected as a function of population by age cohort, unemployment rate, and disposable personal income. The enrollment rates of 18-, 19-, 20-, and 21-year-old women by attendance status were projected as a function of population by age cohort and disposable personal income. The low alternative assumes that age-specific enrollment rates will either equal the middle alternative or change at a slower rate, based on past trends. Under the high alternative, the age-specific enrollment rates are projected to equal the middle alternative or increase at a faster rate, based on past trends for most age groups.

Total Higher Education Enrollment

In 1977, there were 11.3 million students enrolled in institutions of higher education. In the late 1970s and early 1980s, older students, primarily women and part-time students, began to enroll in greater numbers. As a result, college enrollment increased to 12.5 million in 1983. In 1984 and 1985, enrollment declined to 12.2 million. By 1990, it had risen to an estimated 13.9 million, exceeding its previous level attained in 1983 by nearly 1.5 million students (table 3 and figure 8). Under the middle alternative, college enrollment is projected to rise to 16.0 million by the year 2002, an increase of 15 percent. This will represent an average annual growth rate of 1.2 percent over the projection period, less than the growth rate of 1.6 percent during the 1977–90 period. Moreover, the greatest growth will occur toward the end of the projection period. Between 1990 and 1996, college enrollment is projected to increase at an average annual growth rate of 1.0 percent. Between 1996 and 2002, it will grow at an average annual growth rate of 1.3 percent (figure 9). Although the 18- to 24-year-old population is projected to decline until 1996, a decrease of 8 percent from 1990, this population will increase 10 percent by the year 2002. According to the Bureau of the Census, 59 percent of all college students were 18- to 24-years old in 1989. This increase in the younger population, along with enrollment rates remaining above 1990 levels and the continued increases in the number of older students, is expected to offset the decline in the number of 25- to 34-year-olds enrolled in college.

Under the low alternative, college enrollment is projected to increase from an estimated 13.9 million in 1990 to 15.2 million by the year 2002. This will represent an average annual growth rate of 0.8 percent, for an increase of 9 percent over the projection period. This alternative assumes that enrollment rates will either remain the same as the middle alternative or increase at a slower rate.

Under the high alternative, college enrollment is expected to increase from an estimated 13.9 million in 1990 to 17.4 million by the year 2002. This will represent an average annual growth rate of 1.9 percent, for an increase of 25 percent over the projection period. This high level is expected to be maintained during the 1990s and beyond if the enrollment rates remain well above their 1990 levels.

*This term applies mainly to those institutions that provide study beyond secondary school at an institution that offers programs terminating in an associate, baccalaureate, or higher degree

For key enrollment statistics, the following tabulations show (1) the average annual rate of growth (in percent) for 1977–90 and alternative projected growth rates for 1990–2002 and (2) growth rates for 1977–84 and 1984–90 and the middle alternative projected growth rates for 1990–96 and 1996–2002.

Average annual rate of growth (in percent)

	1977–90	1990–2002		
		Low	Middle	High
Total	1.6	0.8	1.2	1.9
Men	0.8	0.2	0.8	1.9
Women	2.4	1.2	1.5	1.8
Full-time	1.1	0.8	1.2	1.8
Part-time	2.4	0.8	1.1	1.9
Public	1.6	0.8	1.2	1.9
Private	1.8	0.7	1.2	1.9
4-year	1.5	0.8	1.2	1.9
2-year	1.9	0.8	1.2	1.9
Undergraduate	1.6	0.8	1.2	1.8
Graduate	1.8	0.6	1.2	2.1
First-professional	1.4	0.5	1.4	2.5
Full-time-equivalent	1.4	0.7	1.2	1.9

Average annual rate of growth (in percent)

(Middle alternative projections)

	1977–84	1984–90	Projected 1990–96	1996–2002
Total	1.2	2.2	1.0	1.3
Men	0.2	1.5	0.6	1.0
Women	2.1	2.8	1.4	1.6
Full-time	0.6	1.6	0.6	1.8
Part-time	2.0	2.9	1.6	0.8
Public	1.0	2.3	1.0	1.3
Private	1.8	1.9	0.9	1.4
4-year	0.9	2.1	0.9	1.4
2-year	1.6	2.3	1.2	1.2
Undergraduate	1.3	2.0	0.9	1.5
Graduate	0.3	3.6	1.9	0.6
First-professional	1.5	1.2	1.8	1.1
Full-time-equivalent	0.9	1.9	0.8	1.6

Enrollment, by Sex of Student

Women played a major role in the increase of enrollment between 1977 and 1990. The enrollment of women in college increased from 5.5 million in 1977 to an estimated 7.5 million in 1990, representing an average annual growth rate of 2.4 percent, for a 37 percent increase over the period (figure 10). Under the middle alternative, enrollment of women is expected to increase to 9.0 million by the year 2002, an increase of 20 percent from 1990. This will represent a growth rate of 1.5 percent per year, considerably less than the growth rate of 2.4 percent for the 1977–90 period. The rate of growth will be lower during the first half of the projection period (1990–96) than during the second half (1996–2002), 1.4 percent per year versus 1.6 percent per year (figure 11). As a share of total college enrollment, women were 54 percent of all college enrollment in 1990 compared with only 49 percent in 1977. Women are expected to increase their share of college enrollment to 56 percent in the year 2002. Under the low and high alternatives, enrollment of women is projected to range between 8.7 million and 9.4 million by the year 2002, representing growth rates of 1.2 percent and 1.8 percent, respectively.

Despite enrollment declines in the late 1970s and fluctuations in enrollment to 1985, the enrollment of men in college has since increased from 5.9 million in 1986 to an estimated 6.4 million in 1990. Over the 1977–90 period, the growth rate of 1.1 percent per year for men was less than half of the rate for women. Under the middle alternative, enrollment of men is expected to increase to 7.0 million in the year 2002, a 10-percent increase from 1990, for an average annual growth rate of 0.8 percent. The growth rate of enrollment of men will be lower in the first half of the projection period than in the second half, 0.6 percent per year versus 1.0 percent per year. Under the low and high alternatives, the numbers of men enrolled in college is projected to range between 6.6 million and 8.0 million, representing growth rates of 0.2 percent and 1.9 percent, respectively.

Enrollment, by Attendance Status

Full-time enrollment increased from 6.8 million in 1977 to an estimated 7.8 million in 1990 (figure 12). This is an average annual rate of 1.1 percent, for an increase of 15 percent over the period. Under the middle alternative, full-time enrollment is expected to rise another 15 percent to 9.0 million by the year 2002, increasing at an annual growth rate of 1.2 percent. Over the projection period, the growth rate for the 1990–96 period will be one-third the growth rate for the 1996–2002 period, 0.6 percent per year versus 1.8 percent per year (figure 13). This is probably due to the increased enrollment of 18- to 24-year-olds, who will most likely be enrolled full-time. Under the low and high alternatives, full-time enrollment is projected to range between 8.6 million and 9.7 million by 2002.

Part-time enrollment increased from 4.5 million in 1977 to an estimated 6.1 million in 1990. This is an average annual growth rate of 2.4 percent, for an increase of 36 percent over the period. Under the middle alternative, part-time enrollment is expected to increase at an average annual growth rate of 1.1 percent and reach 7.0 million by the year 2002, for an increase of 15 percent over the projection period. Unlike full-time enrollment, the growth rate for part-time enrollment during the 1990–96 period will be less than the growth rate for the 1996–2002 period, 1.6 percent versus 0.8 percent, as increasing numbers of younger students enroll full-time and populations

of older students, who intend to enroll part-time, continue to decline over the projection period. Under the low and high alternatives, part-time enrollment is projected to range between 6.7 million and 7.7 million, representing growth rates of 0.8 percent and 1.9 percent, respectively.

Enrollment, by Control of Institution

Enrollment in public institutions grew from 8.8 million in 1977 to an estimated 10.8 million in 1990, increasing at an average annual rate of 1.6 percent, for an increase of 23 percent over the period (figure 14). Under the middle alternative, public enrollment is expected to increase to 12.5 million, rising by an average annual growth rate of 1.2 percent, for an increase of 15 percent over the projection period. During the projection period, enrollment in public institutions is projected to increase at an annual growth rate of 1.0 percent during the 1990–96 period and 1.3 percent during the 1996–2002 period (figure 15). Enrollment in public 4-year institutions is projected to increase from an estimated 5.9 million in 1990 to 6.8 million by the year 2002. Enrollment in public 2-year institutions is expected to increase from 4.9 million in 1990 to 5.7 million in the year 2002.

Under the low and high alternatives, enrollment in public institutions is expected to range between 11.9 million and 13.5 million by the year 2002. For the low alternative, this is a projected average annual growth rate of 0.7 percent over the projection period. For the high alternative, it is a growth rate of 1.9 percent.

Enrollment in private institutions increased from 2.4 million in 1977 to an estimated 3.1 million in 1990, increasing at an average annual growth rate of 1.8 percent, for an increase of 27 percent over the period. Under the middle alternative, private enrollment is expected to increase to 3.6 million, rising by an average annual growth rate of 1.2 percent, for an increase of 15 percent over the projection period. During the projection period, enrollment in private institutions is projected to increase at an annual growth rate of 0.9 percent during the 1990–96 period and 1.4 percent during the 1996–2002 period. Enrollment in private 4-year institutions is expected to increase from an estimated 2.8 million in 1990 to 3.2 million by the year 2002. Enrollment in private 2-year institutions is projected to increase from an estimated 272,000 in 1990 to 314,000 by the year 2002.

Under the low and high alternatives, enrollment in private institutions is expected to range between 3.4 million and 3.9 million by the year 2002. For the low alternative, this is a projected average annual growth rate of 0.7 percent over the projection period. For the high alternative, it will be a growth rate of 1.9 percent.

Enrollment, by Type of Institution

Enrollment in 4-year institutions increased from 7.2 million in 1977 to an estimated 8.7 million in 1990, increasing at an average annual growth rate of 1.5 percent, for a 21-percent increase over the period (table 4 and figure 16). Under the middle alternative, enrollment in 4-year institutions is expected to rise to 10.0 million by the year 2002, increasing at an average annual growth rate of 1.2 percent, for a 15-percent increase over the projection period. During the projection period, enrollment in 4-year institutions is projected to increase at an annual growth rate of 0.9 percent during the 1990-96 period and 1.4 percent during the 1996-2002 period (figure 17).

Under the low and high alternatives, enrollment in 4-year institutions is expected to range between 9.5 million and 10.9 million by the year 2002. For the low alternative, this is a projected average annual growth rate of 0.9 percent over the projection period. For the high alternative, it is a growth rate of 1.4 percent.

Enrollment in 2-year institutions rose from 4.0 million in 1977 to an estimated 5.2 million in 1990, increasing at an average annual growth rate of 1.9 percent, for a 28-percent increase over the period (table 5). Under the middle alternative, enrollment in 2-year institutions is expected to rise to 6.0 million by the year 2002, increasing at an average annual growth rate of 1.2 percent, for a 15-percent increase over the projection period. During the projection period, enrollment in 2-year institutions is projected to increase at an annual growth rate of 1.2 percent during the 1990–96 period and 1.2 percent during the 1996–2002 period.

Under the low and high alternatives, enrollment in 2-year institutions is expected to range between 5.7 million and 6.5 million by the year 2002. For the low alternative, this is a projected average annual growth rate of 0.8 percent over the projection period. For the high alternative, it is a growth rate of 1.9 percent.

Enrollment, by Level

Undergraduate enrollment increased from 9.7 million in 1977 to an estimated 12.0 million in 1990, increasing at an average annual growth rate of 1.6 percent, for a 23-percent increase over the period (table 14 and figure 18). Under the middle alternative, undergraduate enrollment is expected to increase to 13.7 million by the year 2002, at a growth rate of 1.2 percent per year, for a 15-percent increase over the projection period. During the projection period, undergraduate enrollment is projected to increase at an annual growth rate of 0.9 percent during the 1990–1996 period and 1.5 percent during the 1996–2002 period (figure 19). Between 1990 and 2002, full-time undergraduate students are expected to account for most of the increase, rising from an estimated 7.0 million in 1990 to 8.0 million by the year 2002. Part-time undergraduate

enrollment is projected to increase from an estimated 5.0 million in 1990 to 5.8 million by the year 2002.

Under the low and high alternatives, undergraduate enrollment is expected to range between 13.1 million and 14.9 million by the year 2002. For the low alternative, this is a projected average annual growth rate of 0.8 percent over the projection period. For the high alternative, is a growth rate of 1.8 percent.

Graduate enrollment rose from 1.3 million in 1977 to an estimated 1.5 million in 1990, at an average annual growth rate of 1.8 percent, for a 26-percent increase over the period (table 17 and figure 20). Under the middle alternative, graduate enrollment is expected to increase to 1.9 million by the year 2002, increasing at an average annual growth rate of 1.2 percent, for a 16-percent increase over the projection period. During the projection period, graduate enrollment is projected to increase at an annual growth rate of 1.9 percent during the 1990–96 period and 0.6 percent during the 1996–2002 period (figure 21). The slower rate of growth in the 1996–2002 period reflects a decrease in the number of older students.

Under the low and high alternatives, graduate enrollment is expected to range between 1.8 million and 2.1 million by the year 2002. For the low alternative, this is a projected average annual growth rate of 1.2 percent over the projection period. For the high alternative, it is a growth rate of 2.1 percent.

First-professional enrollment increased from 251,000 in 1977 to an estimated 300,000 in 1990, an average annual growth rate of 1.4 percent, for a 20-percent increase over the period (table 20 and figure 20). Under the middle alternative, first-professional enrollment is expected to increase to 356,000 by the year 2002, increasing at an average annual growth rate of 1.4 percent, for a 19-percent increase over the projection period. During the projection period, first-professional enrollment is projected to increase at an annual growth rate of 1.8 percent during the 1990–96 period and 1.1 percent during the 1996–2002 period.

Under the low and high alternatives, first-professional enrollment is expected to range between 320,000 and 402,000 by the year 2002. For the low alternative, this is a projected average annual growth rate of 0.5 percent over the projection period. For the high alternative, it is a growth rate of 2.5 percent.

Full-Time-Equivalent Enrollment

Full-time-equivalent enrollment increased from 8.4 million in 1977 to an estimated 10.0 million in 1990, increasing at an average annual rate of growth of 1.4 percent, for a 19-percent increase over the period (table 23 and figure 22). Under the middle alternative, full-time equivalent enrollment is expected to increase to 11.6 million by the year 2002, increasing at an average annual growth rate of 1.2 percent, for an 18-percent increase over the projection period. During the projection period, full-time-equivalent enrollment is projected to increase at an annual growth rate of 0.8 percent during the 1990–96 period and 1.6 percent during the 1996–2002 period (figure 23).

The full-time-equivalent of undergraduate enrollment in 4-year institutions, which was an estimated 5.6 million in 1990, will be 6.6 million by the year 2002. The full-time-equivalent of undergraduate enrollment in 2-year institutions, which was an estimated 3.0 million in 1990, will be 3.4 million by the year 2002.

In public institutions, full-time-equivalent enrollment, which was an estimated 7.5 million in 1990, will be 8.7 million by the year 2002. In private institutions, full-time-equivalent enrollment, which was an estimated 2.5 million in 1990, will be 2.9 million by the year 2002.

Under the low and high alternatives, full-time-equivalent enrollment is expected to range between 11.0 million and 12.5 million by the year 2002. For the low alternative, this is a projected average annual growth rate of 0.7 percent over the projection period. For the high alternative, it is a growth of 1.9 percent.

Enrollment, by Age

The alternative projections of higher education enrollment by age, sex, and attendance status are shown in table 6 (middle alternative projections), table 7 (low alternative projections), and table 8 (high alternative projections). These projections are based on age-specific enrollment data from the Bureau of the Census and enrollment data from NCES.

Under the middle alternative, the period from 1982 to 2002 will be one of change in the age distribution of college students. The enrollment of students who are 18- to 24-years old in reased from 7.3 million in 1982 to an estimated 7.7 million in 1990, an increase of only 4 percent. This number is expected to increase to 8.9 million by the year 2002, an increase of 16 percent. As a result, the proportion of students under 25 years old, which fell from 61.0 percent in 1982 to 56.3 percent in 1990, is projected to be 56.7 percent by the year 2002 (figure 24). Corresponding percentages for men and women are shown in figures 25 and 26.

On the other hand, the enrollment of students who are 25 years old and over increased from 4.8 million in 1982 to an estimated 6.1 million in 1990, an increase of 26 percent. This number is projected to increase to 6.9 million by the year 2002, an increase of 14 percent. The projected smaller percent increase in the enrollment of students 25 years old and over is due, in part, to the declines in the 25- to 29-year-old population and the 30- to 34-year-old population over the projection period. However, the 35- to 44-year-old population will continue to increase for most of the projection period, contributing to the growth during this period. Over the projection period, the proportion of students 25 years old and over rose from

39.0 percent in 1982 to 43.7 percent in 1990. This proportion is projected to be 43.2 percent by the year 2002.

Among college students of all ages, the number of women is expected to increase at a faster rate than the number of men. Between 1990 and 2002, women under 25 years old and those 25 years old and over are projected to increase by 22 percent and 17 percent, respectively. On the other hand, men under 25 years old and those 25 years old and over are projected to increase by 9 percent and 11 percent, respectively.

Under the low and high alternatives, the college enrollment of students 18- to 24-years old is projected to range between 8.6 million and 9.6 million by the year 2002. The college enrollment of students 25 years old and over is expected to range between 6.4 million and 7.6 million by the year 2002.

Figure 6

College-age populations (18-24 years and 25-29 years), with projections: 1977 to 2002

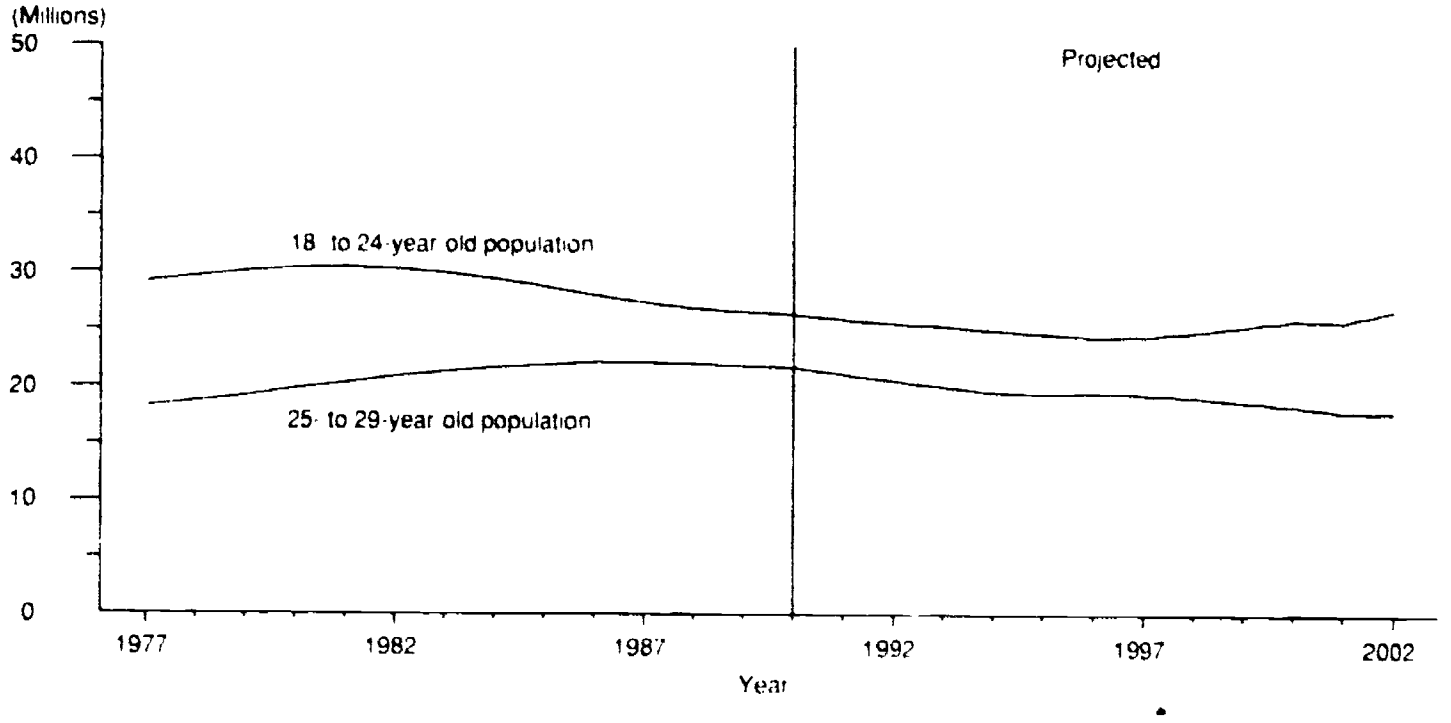


Figure 7

College-age populations (30-34 years and 35-44 years), with projections: 1977 to 2002

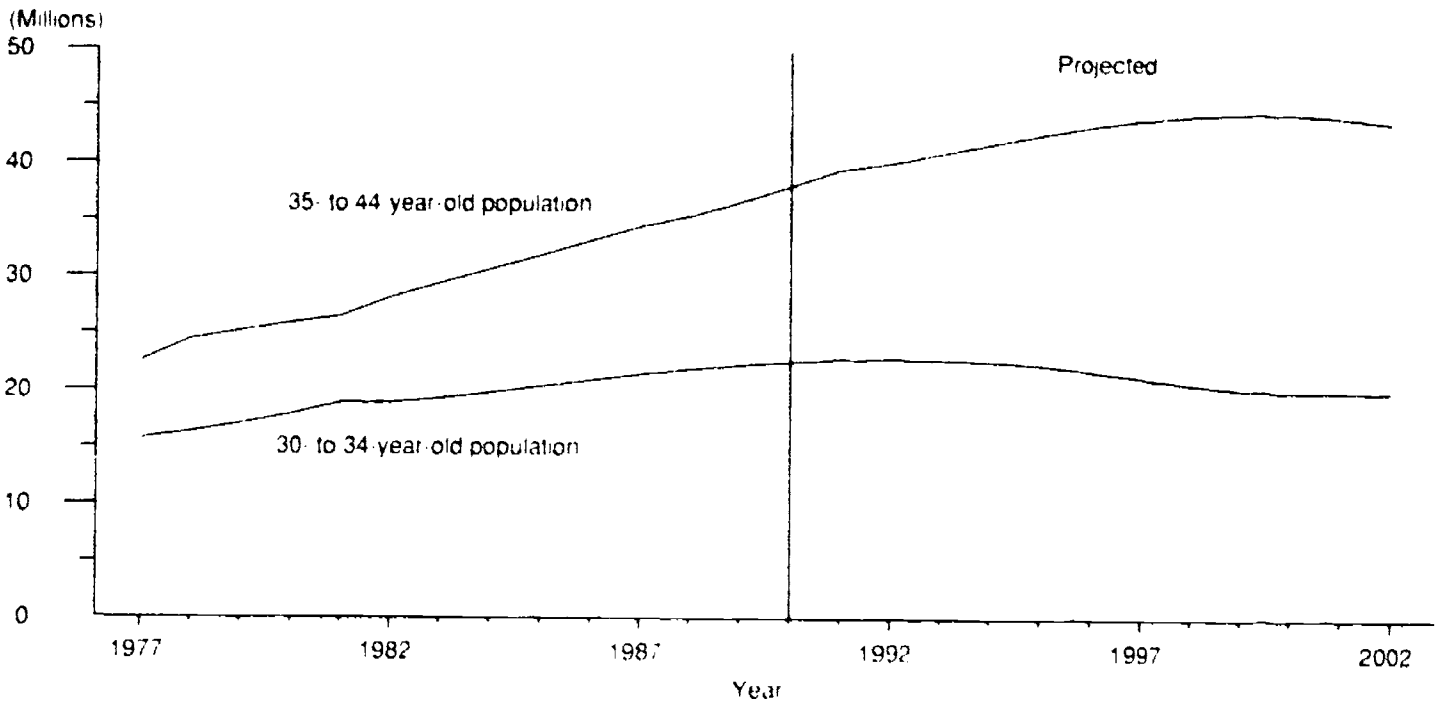


Figure 8

Enrollment in institutions of higher education, with alternative projections: Fall 1977 to fall 2002

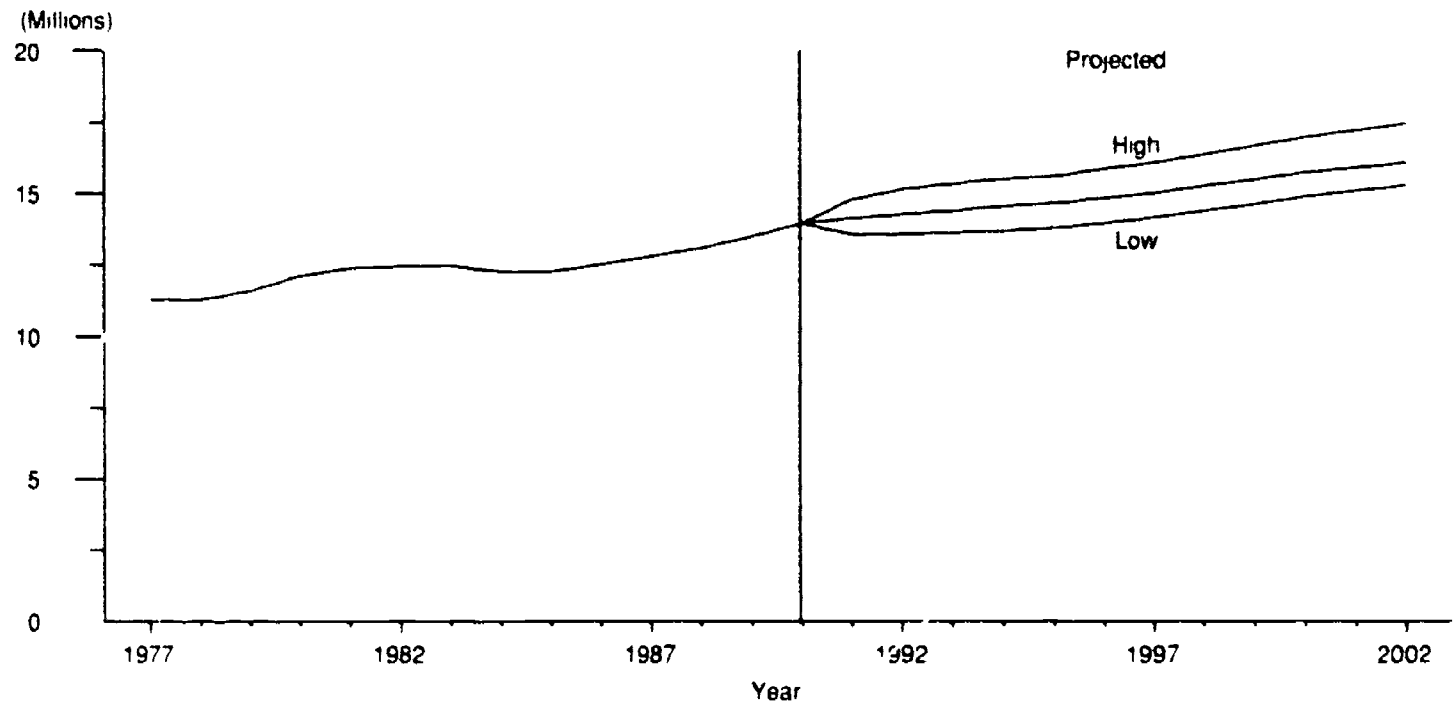


Figure 9

Average annual growth rates for total higher education enrollment

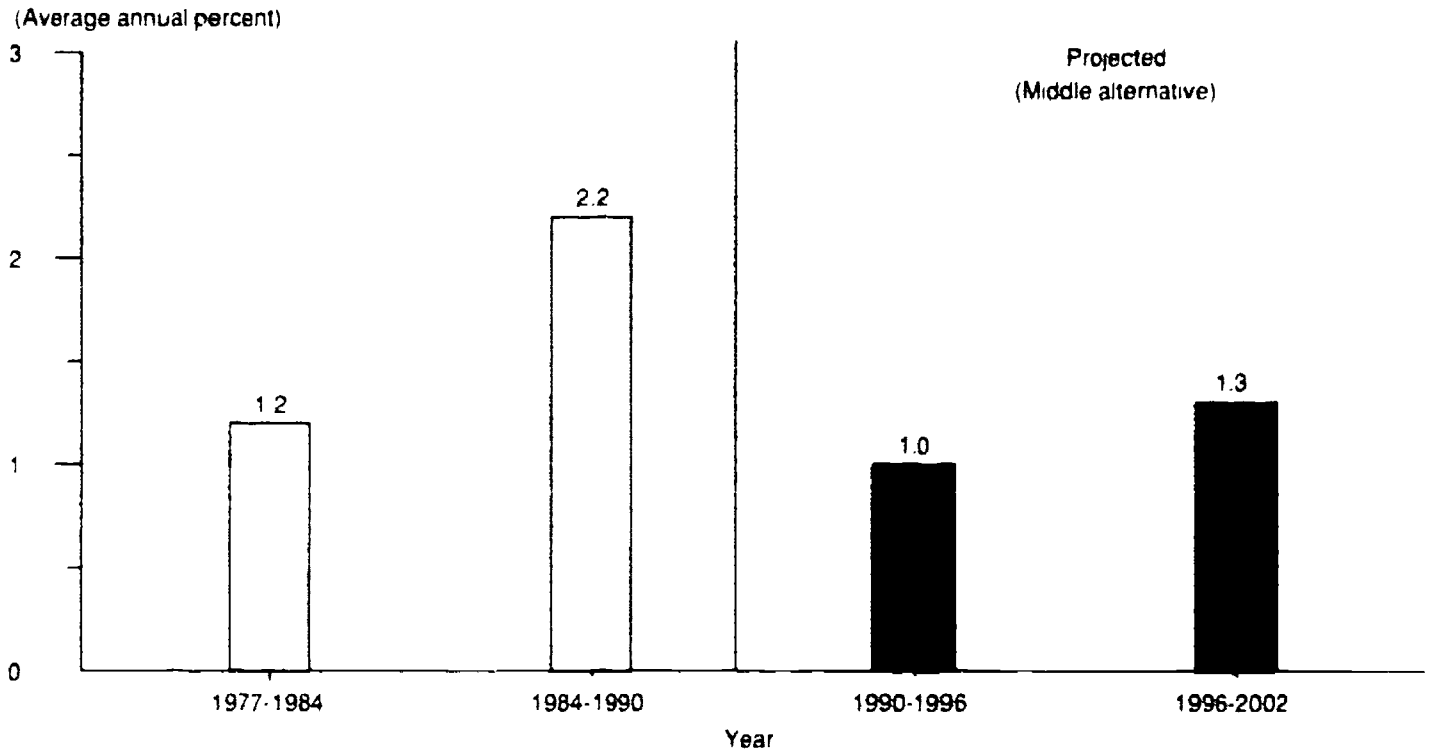


Figure 10

Enrollment in institutions of higher education, by sex, with middle alternative projections: Fall 1977 to fall 2002

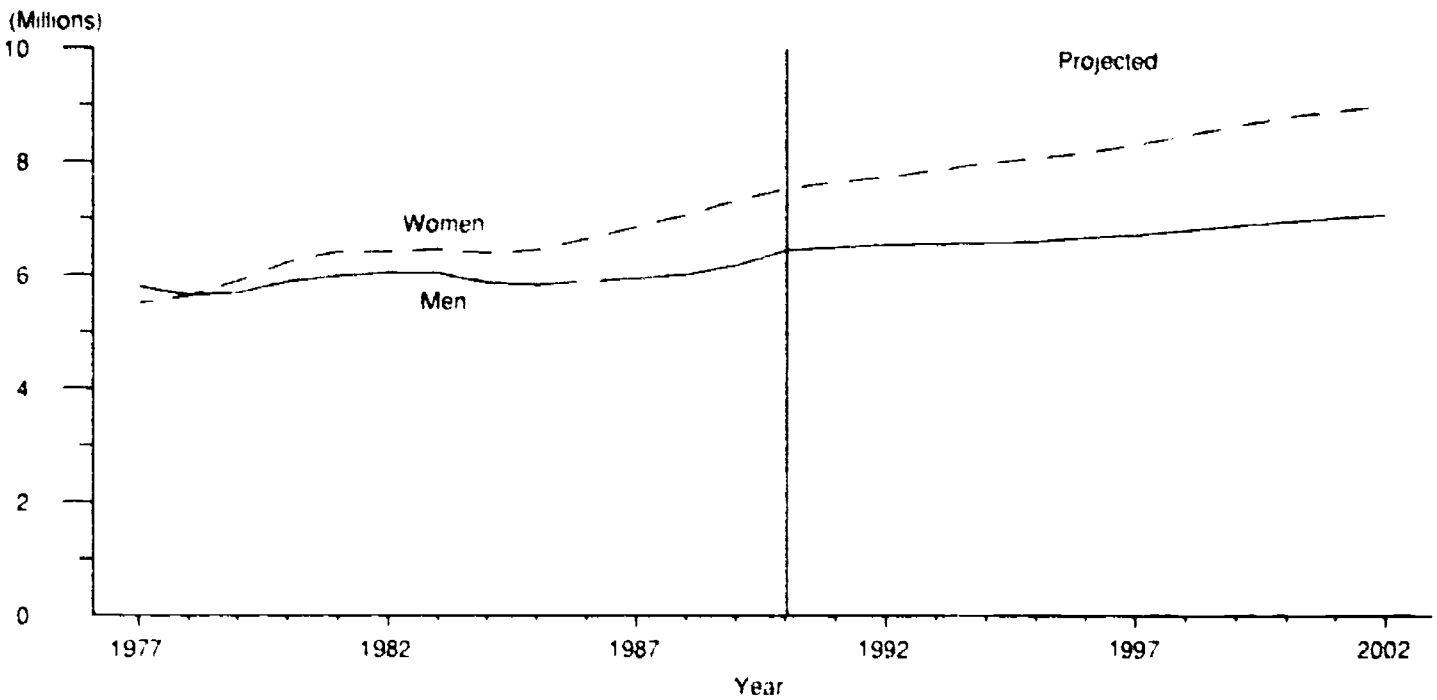


Figure 11

Average annual growth rates for total higher education enrollment, by sex

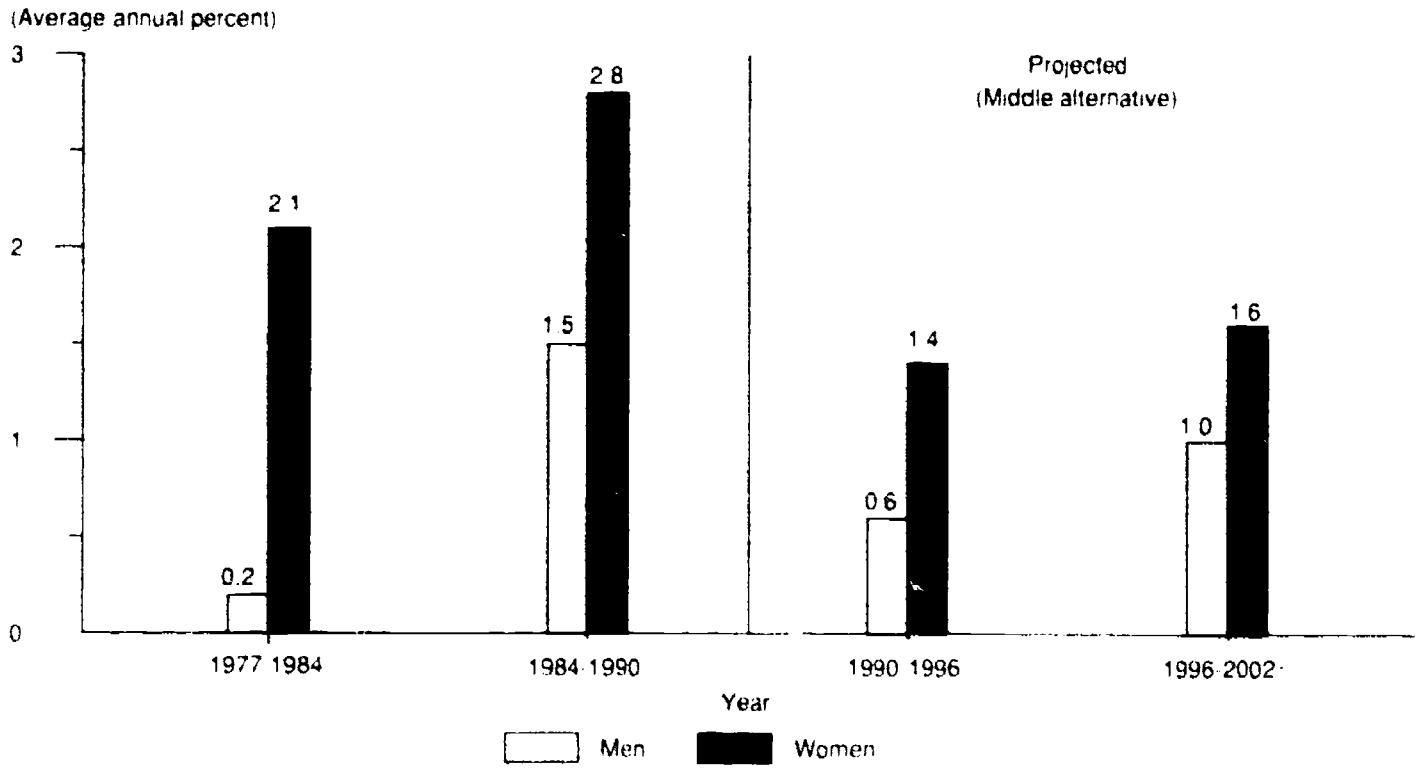


Figure 12

Enrollment in institutions of higher education, by attendance status, with middle alternative projections: Fall 1977 to fall 2002

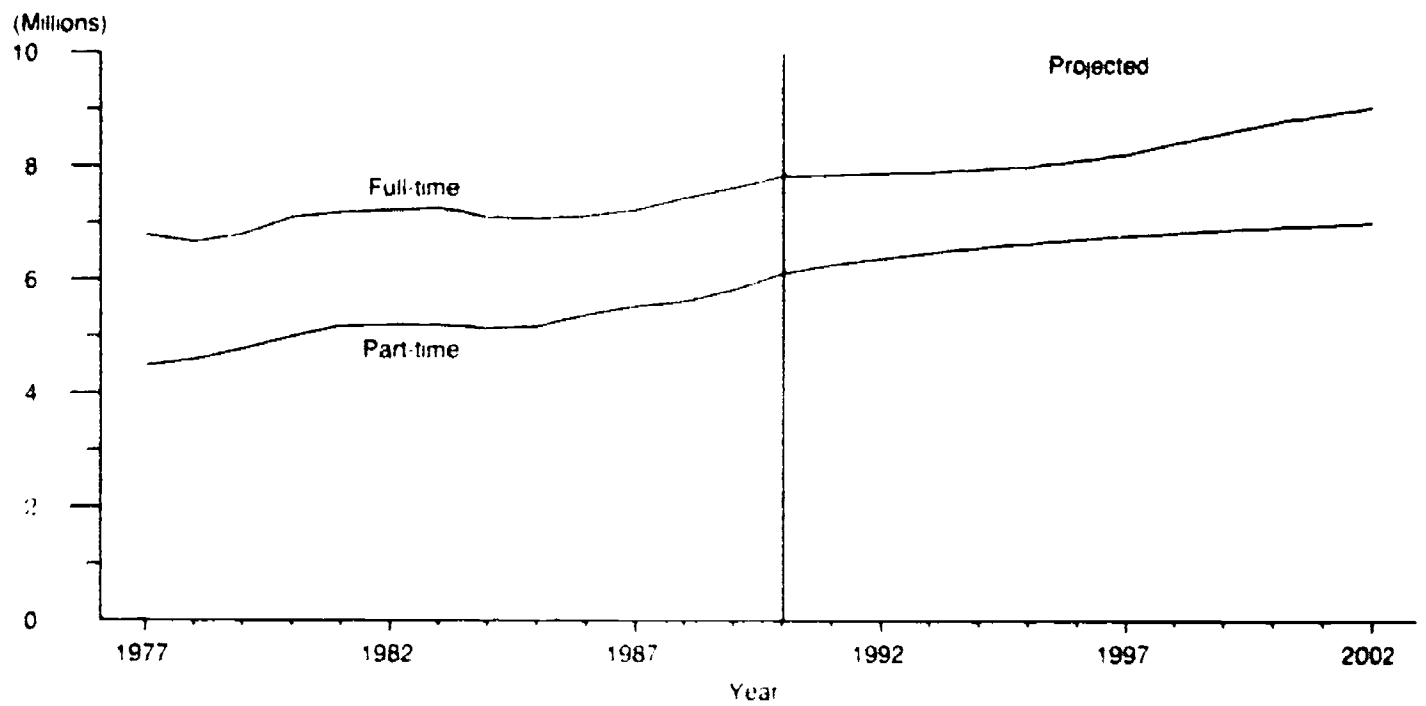


Figure 13

Average annual growth rates for total higher education enrollment, by attendance status

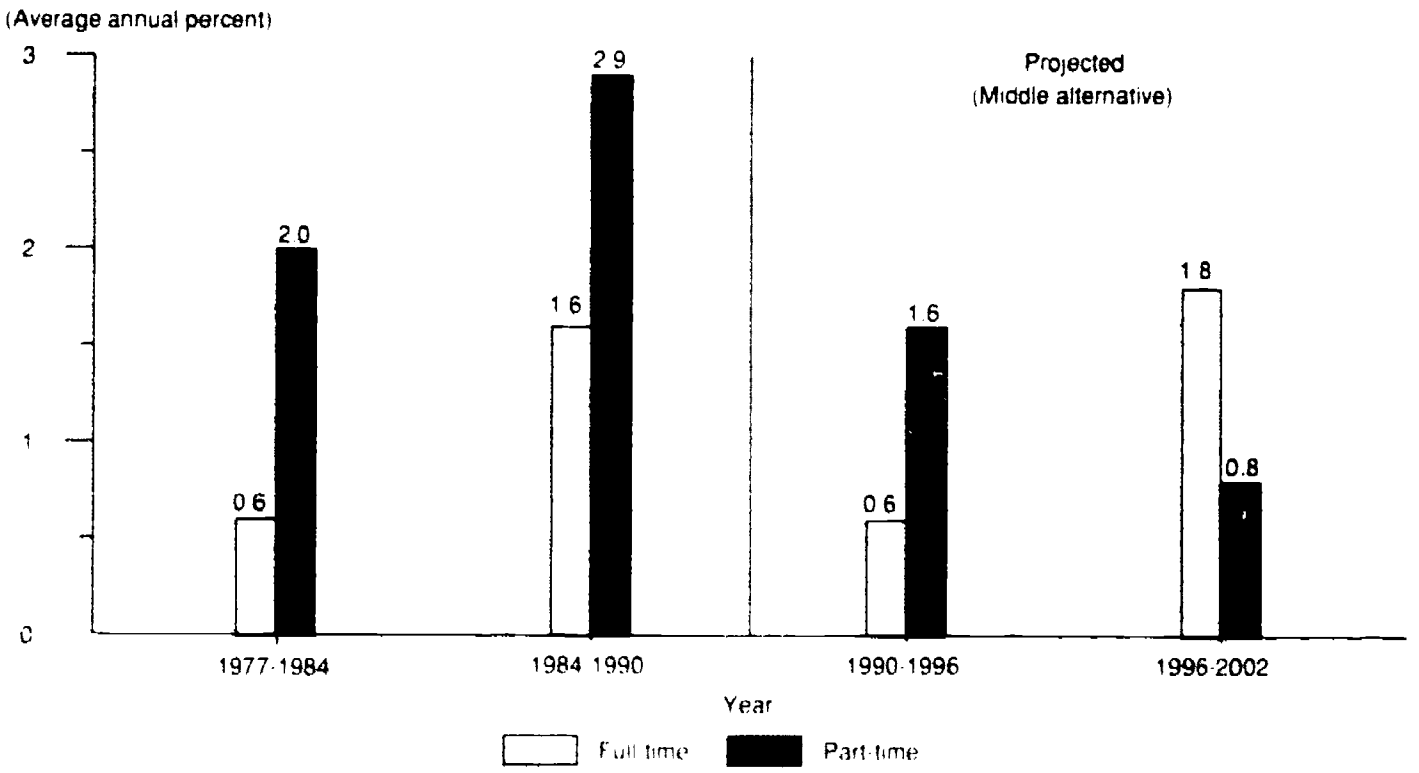


Figure 14

Enrollment in institutions of higher education, by control of institution, with alternative projections: Fall 1977 to fall 2002

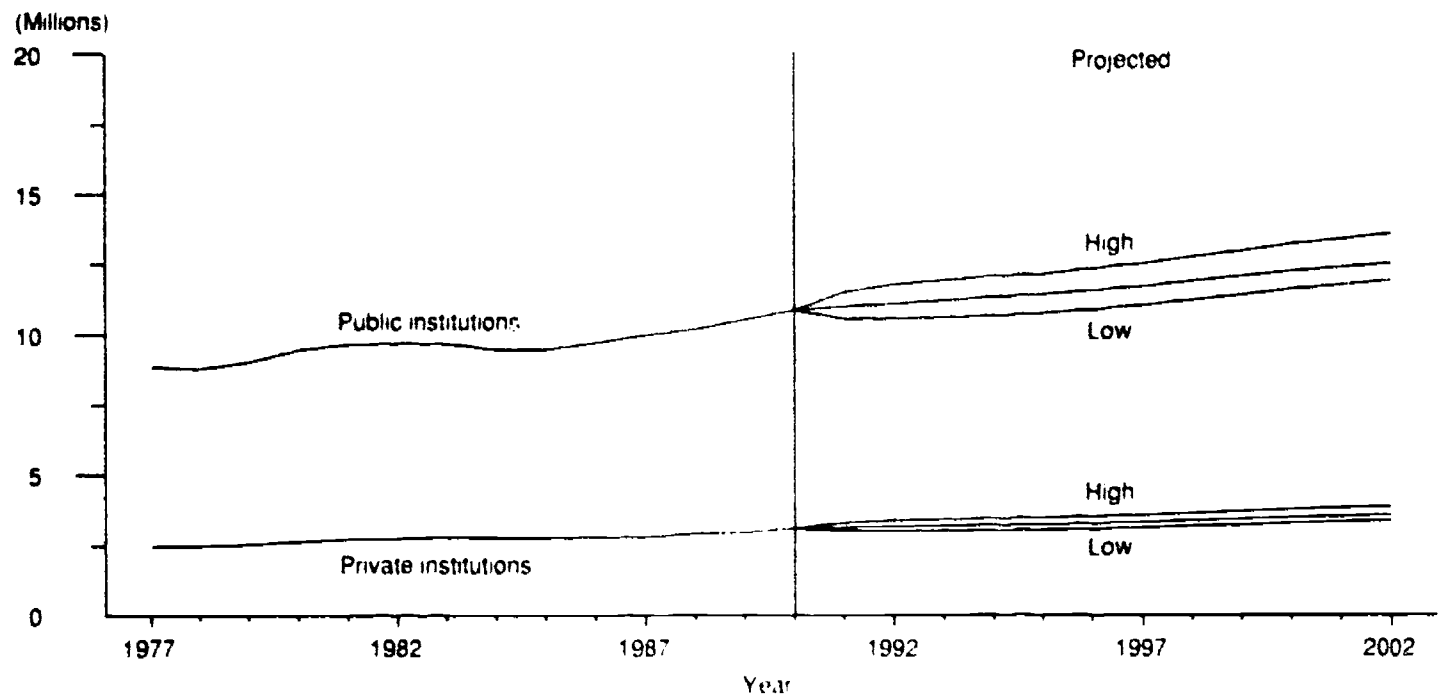


Figure 15

Average annual growth rates for total higher education enrollment, by control of institution

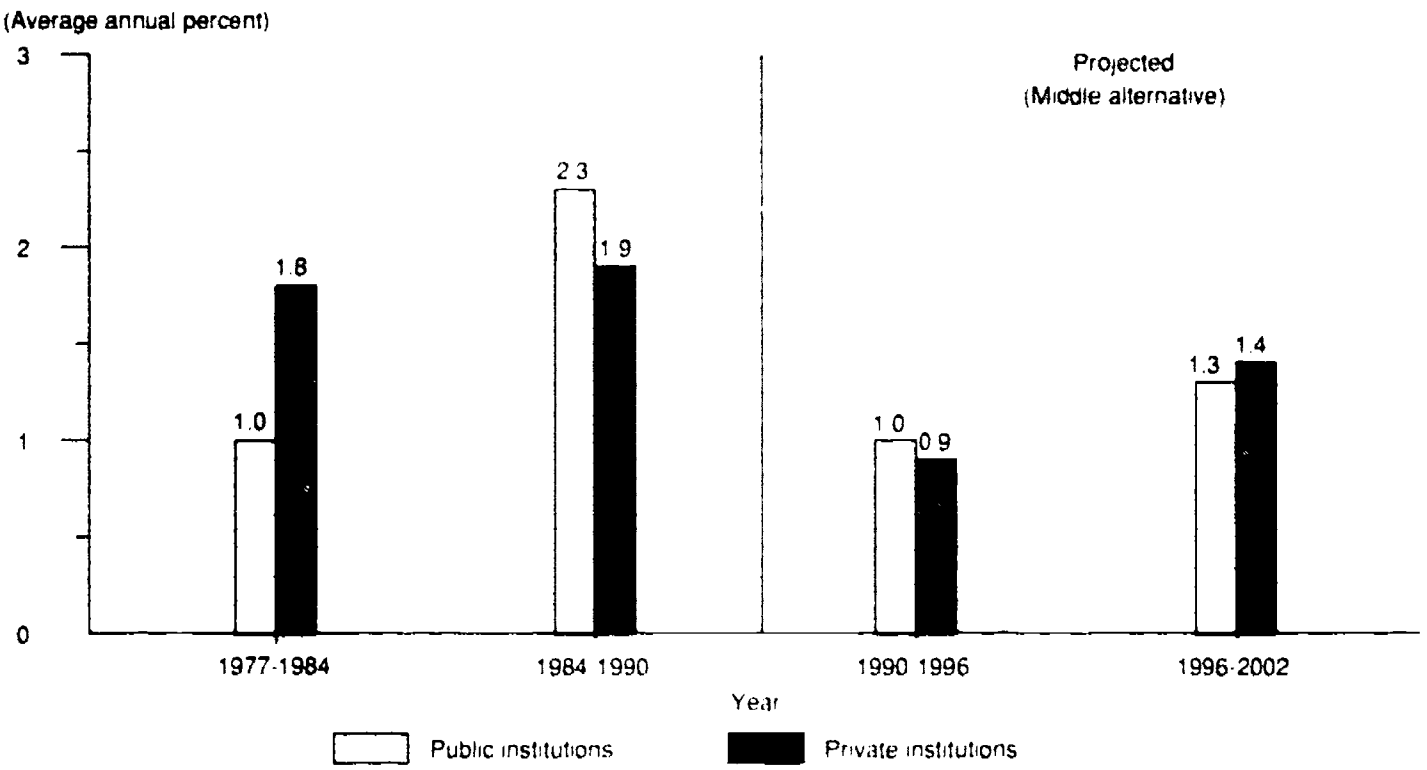


Figure 16

Enrollment in institutions of higher education, by type of institution, with alternative projections: Fall 1977 to fall 2002

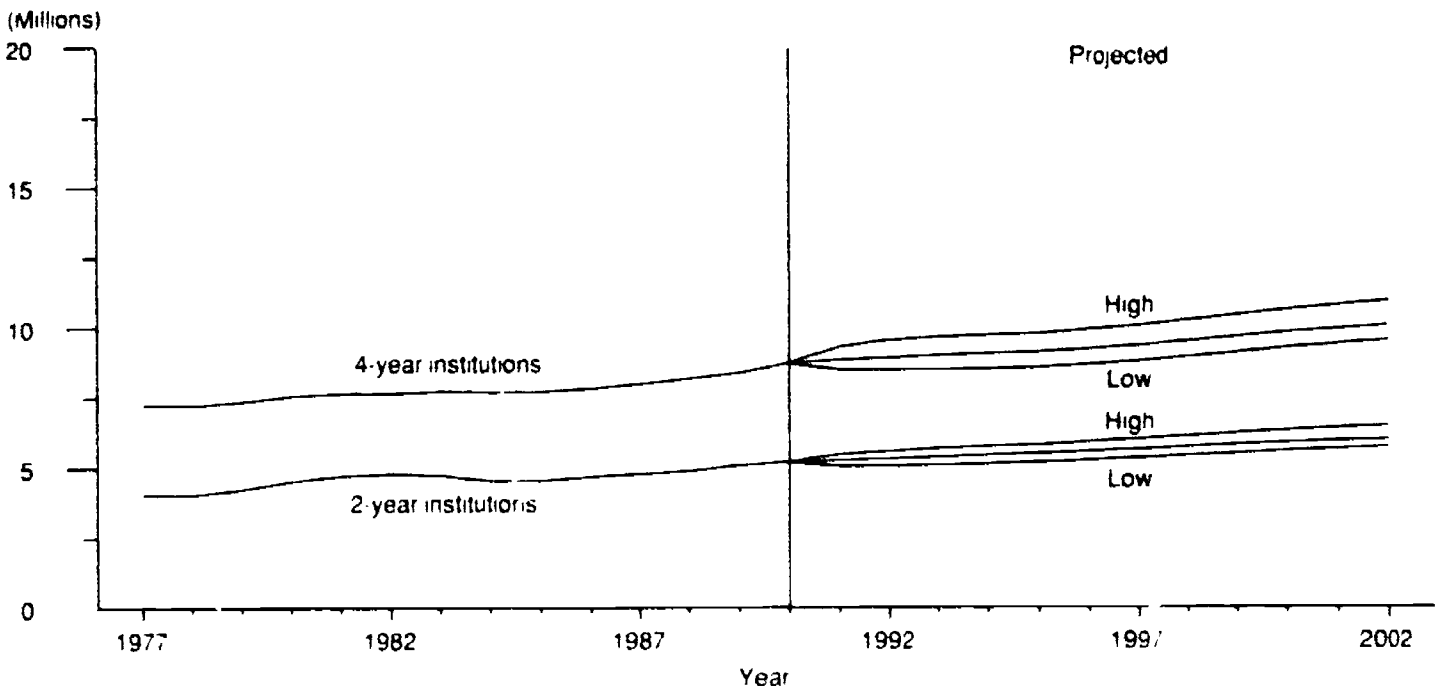


Figure 17

Average annual growth rates for total higher education enrollment, by type of institution

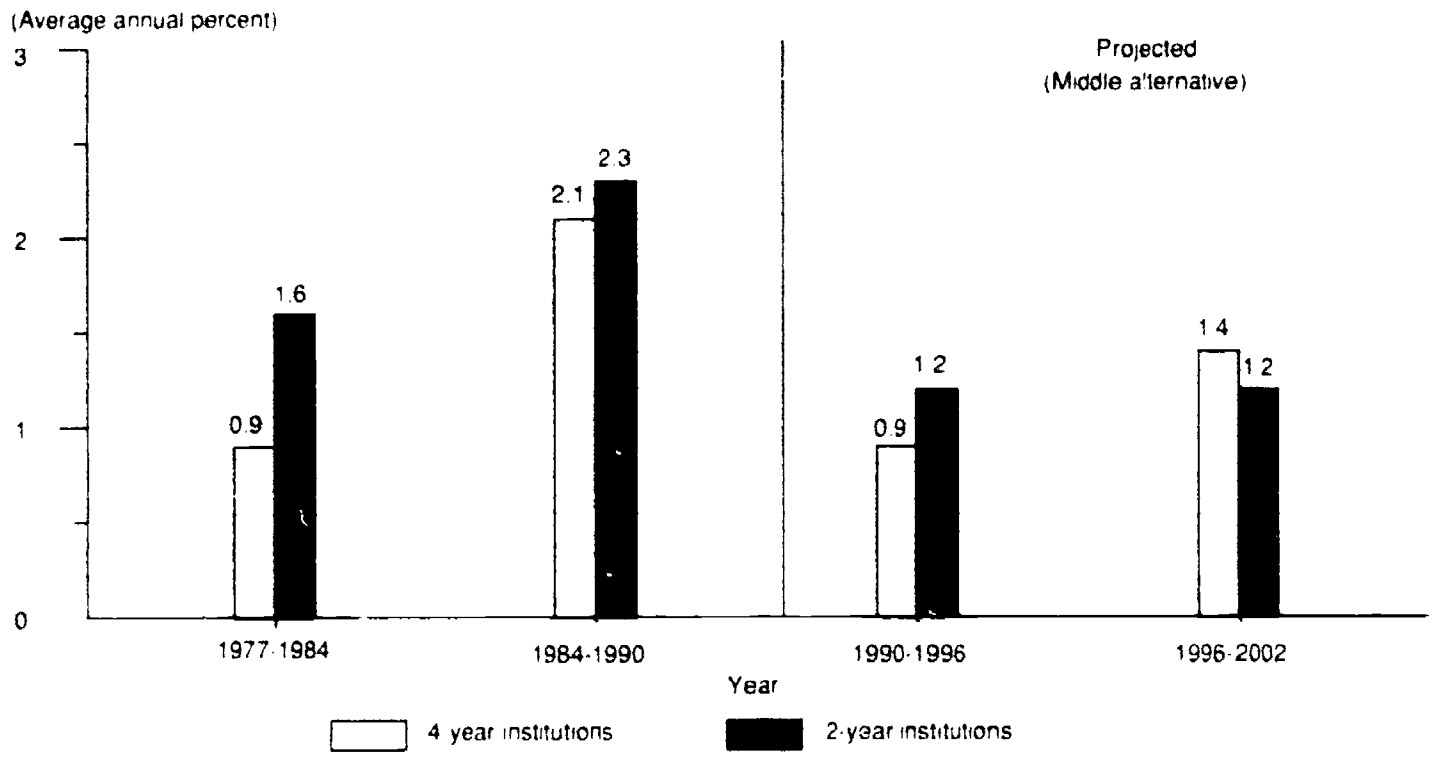


Figure 18

Undergraduate enrollment in institutions of higher education, with alternative projections: Fall 1977 to fall 2002

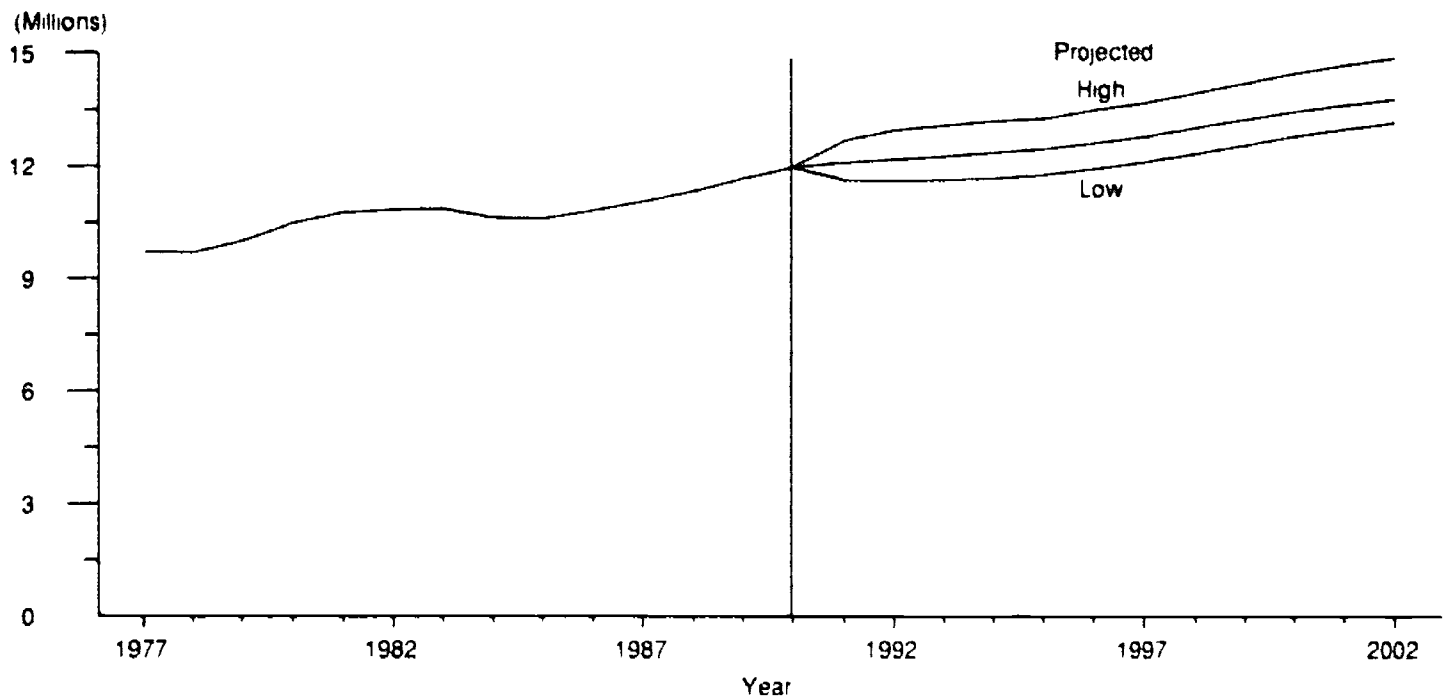


Figure 19

Average annual growth rates for undergraduate enrollment

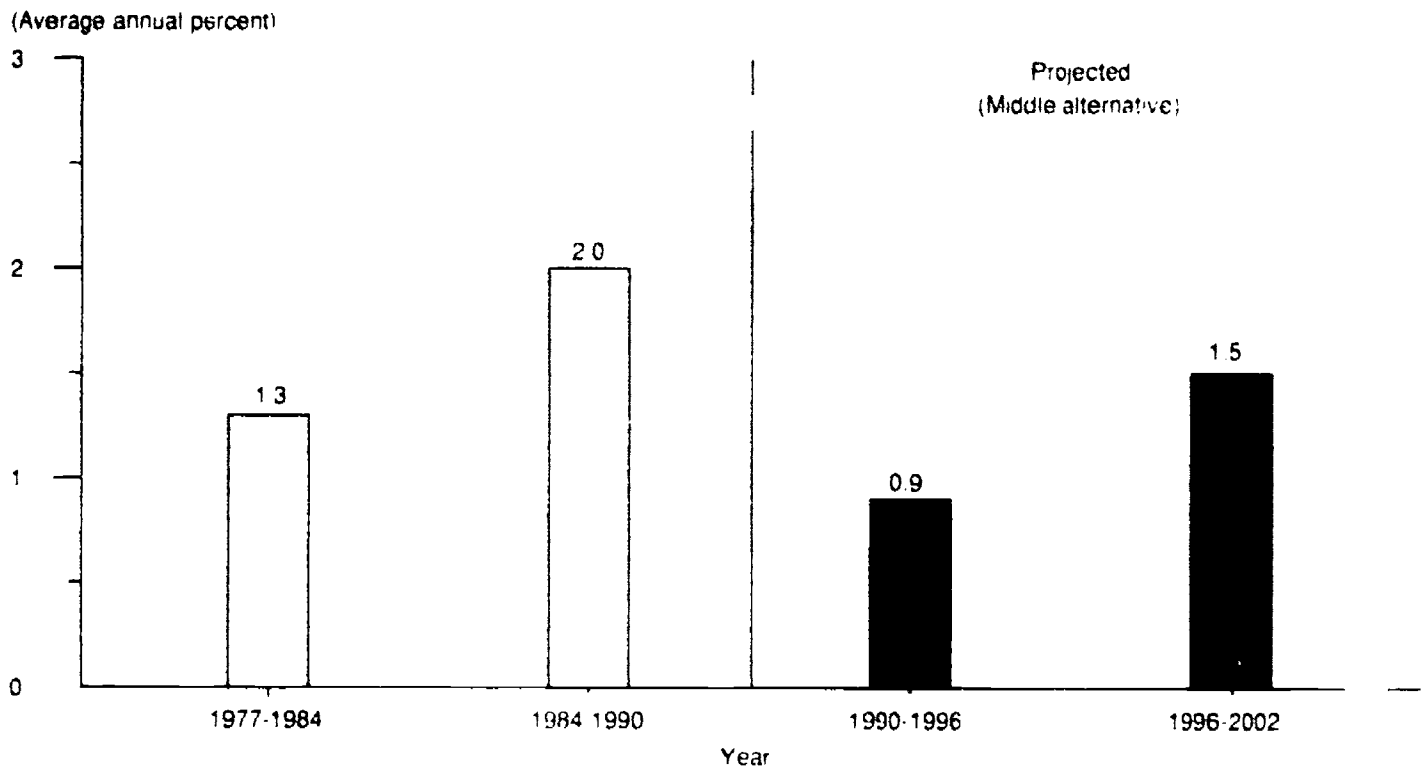


Figure 20

Postbaccalaureate enrollment in institutions of higher education, with alternative projections: Fall 1977 to fall 2002

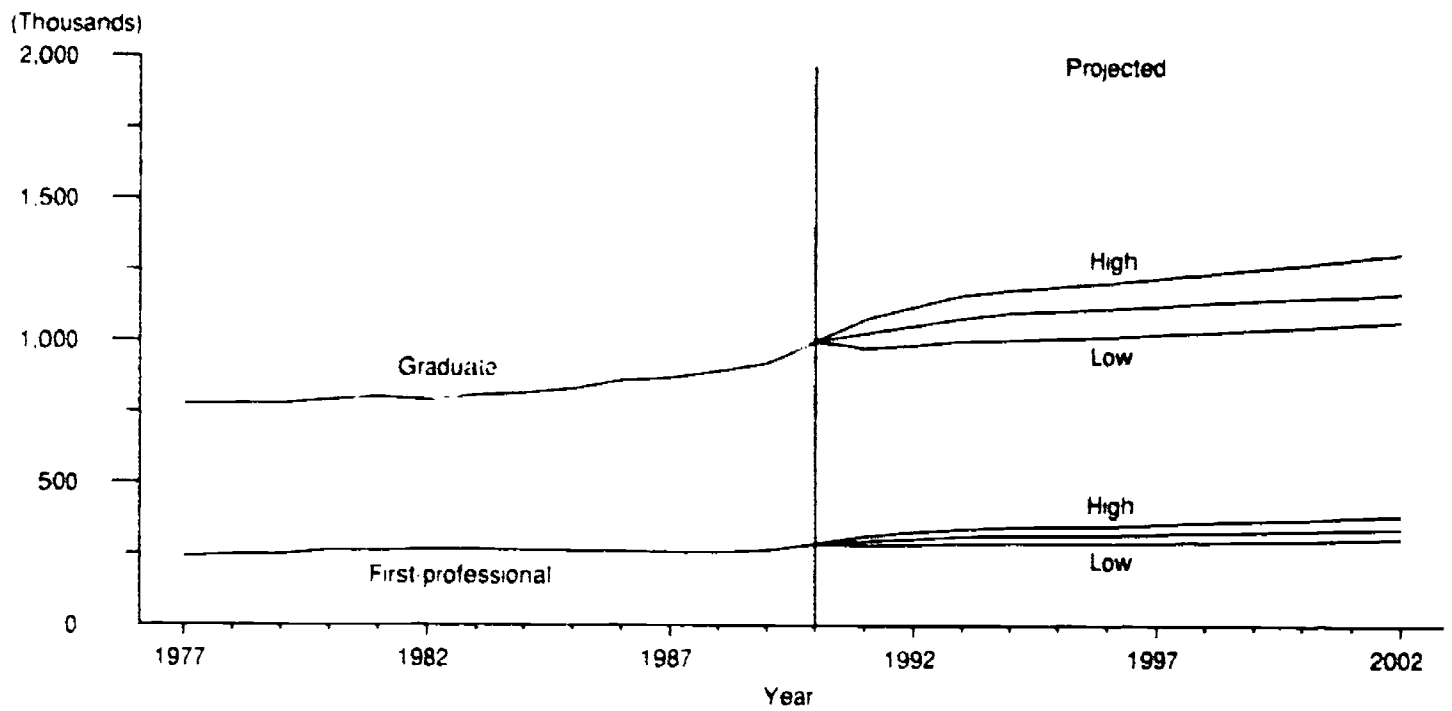


Figure 21

Average annual growth rates for postbaccalaureate enrollment

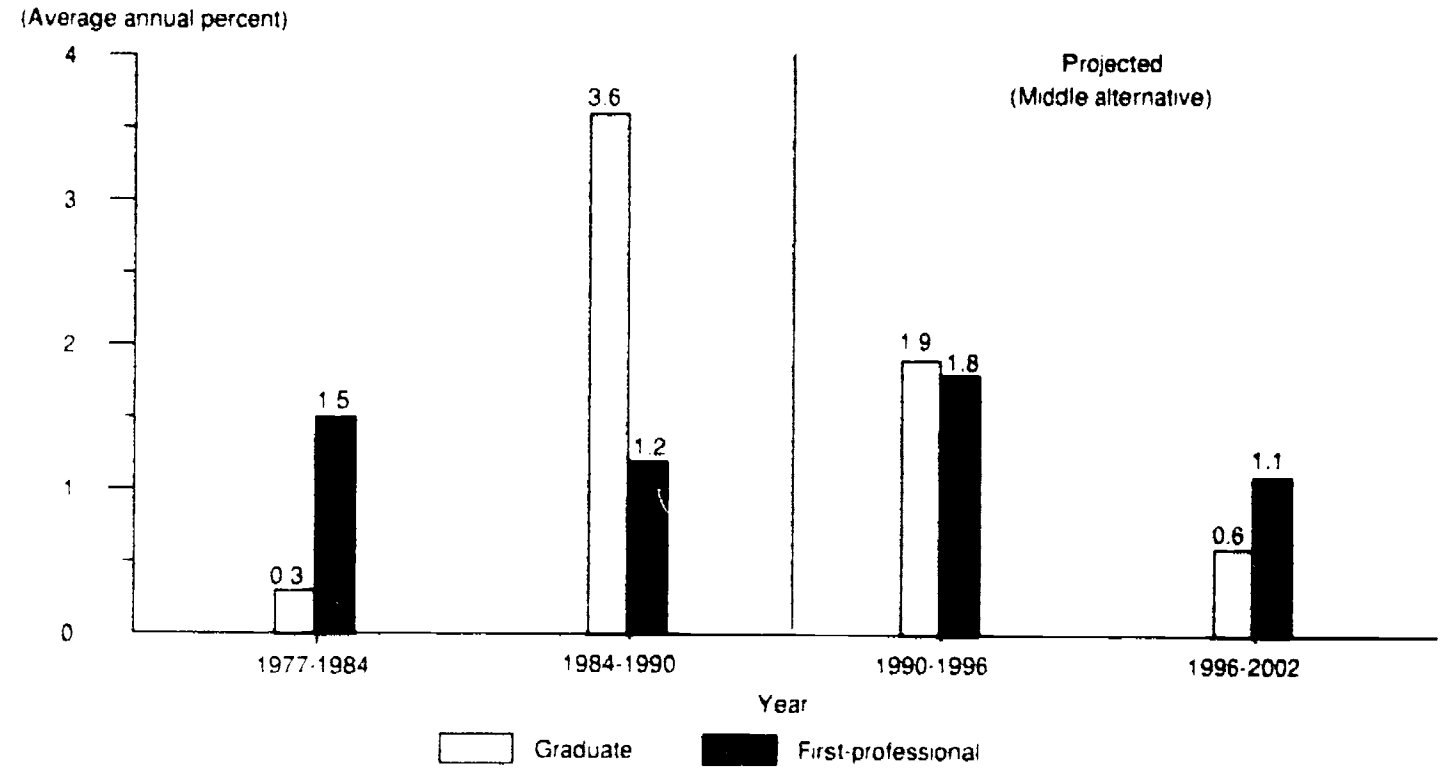


Figure 22

Full-time-equivalent enrollment in institutions of higher education, with alternative projections: Fall 1977 to fall 2002

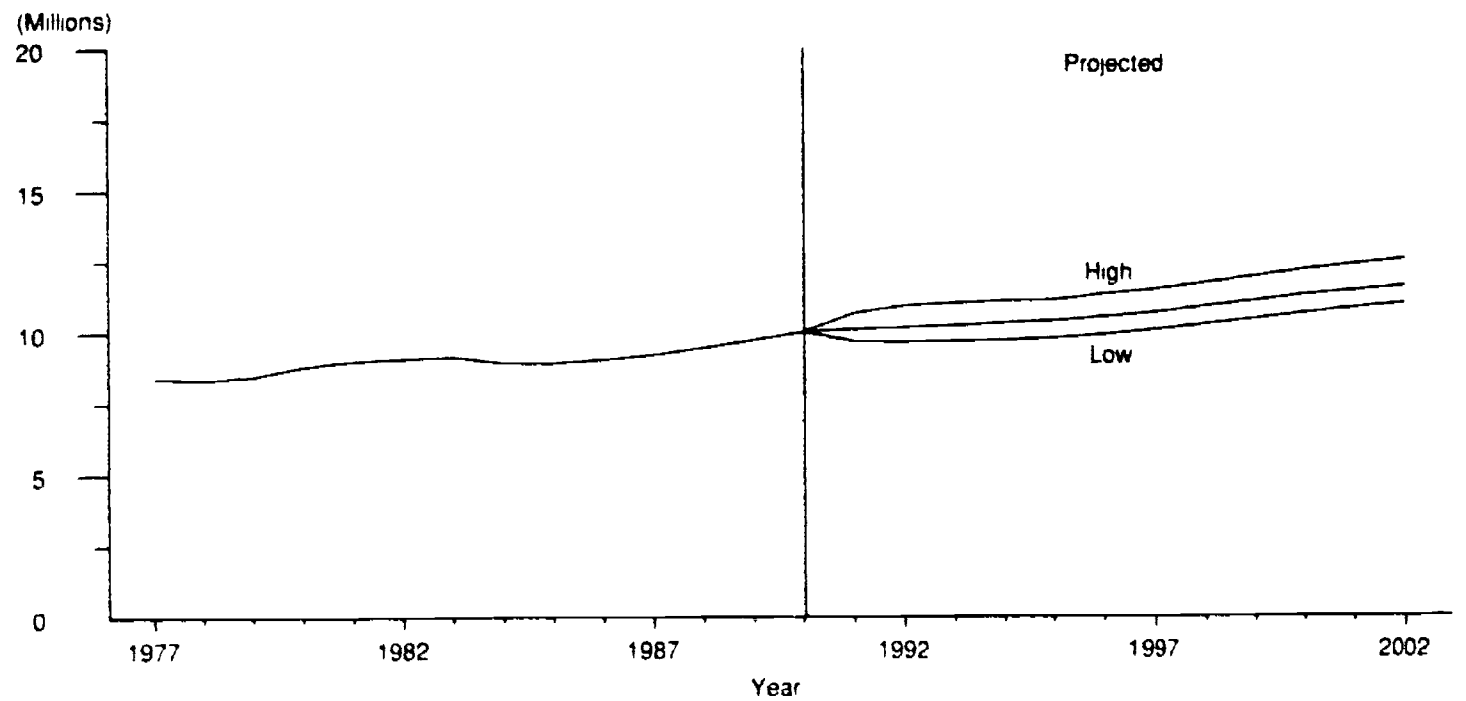


Figure 23

Average annual growth rates for full-time-equivalent enrollment

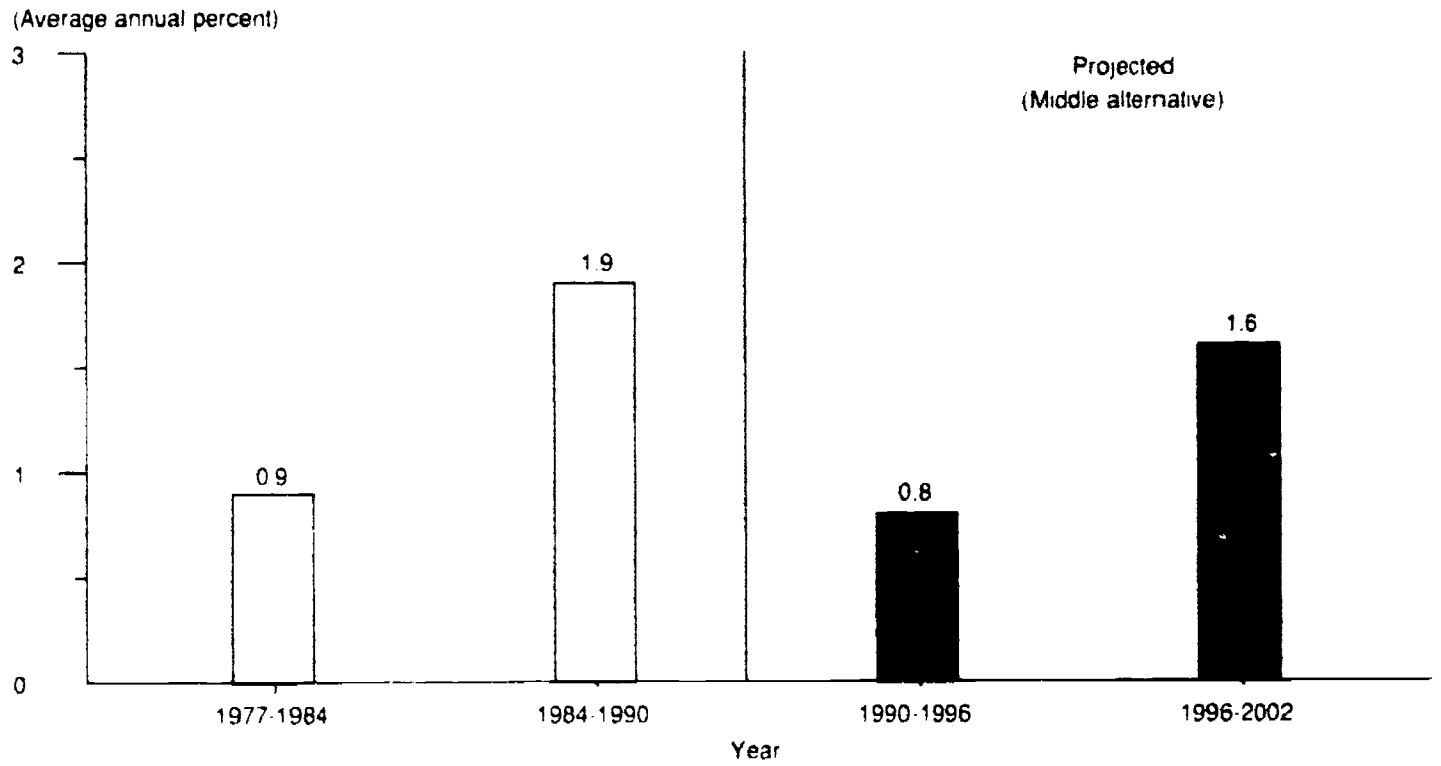
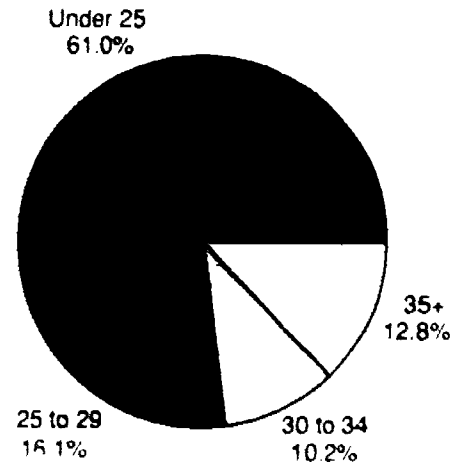


Figure 24

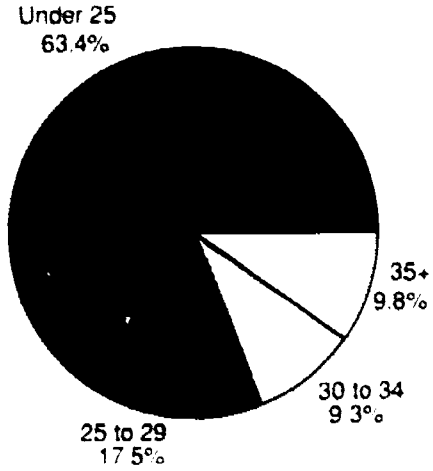
Percentage distribution of enrollment in institutions of higher education, by age group: Fall 1982, 1990, and 2002



NOTE: The age distribution for 2002 is based on middle alternative projections

Figure 25

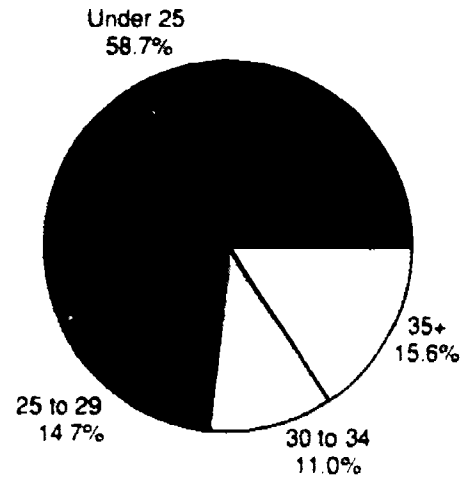
Percentage distribution of men enrolled in institution of higher education, by age group: Fall 1982, 1990, and 2002



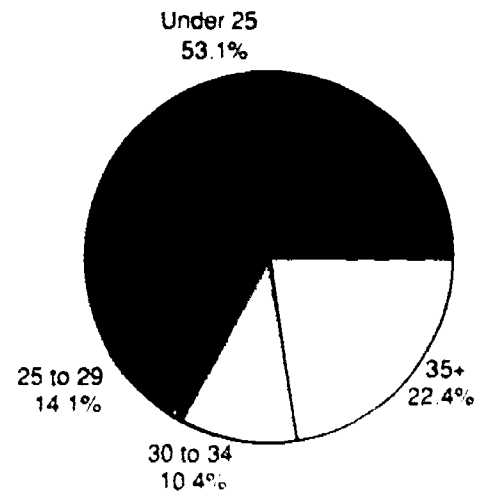
NOTE The age distribution for 2002 is based on middle alternative projections

Figure 26

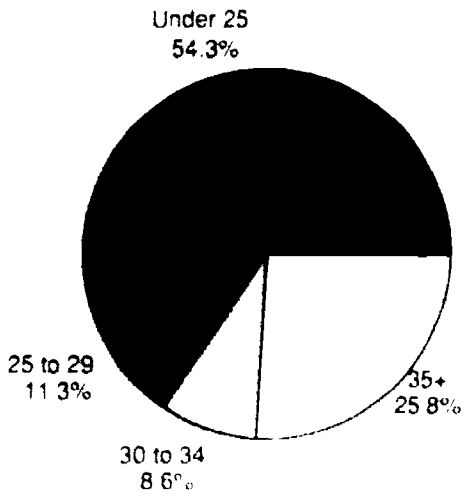
Percentage distribution of women enrolled in institution of higher education, by age group: Fall 1982, 1990, and 2002



1982



1990



2002

NOTE: The age distribution for 2002 is based on middle alternative projections

Table 3.—Total enrollment in all institutions of higher education, by sex, attendance status, and control of institution, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Sex		Attendance status		Control	
		Men	Women	Full-time	Part-time	Public	Private
1977	11,286	5,789	5,497	6,793	4,493	8,847	2,439
1978	11,260	5,641	5,619	6,668	4,592	8,786	2,474
1979	11,570	5,683	5,887	6,794	4,776	9,037	2,533
1980	12,097	5,874	6,223	7,098	4,999	9,457	2,640
1981	12,372	5,975	6,397	7,181	5,190	9,647	2,725
1982	12,426	6,031	6,394	7,221	5,205	9,696	2,730
1983	12,465	6,024	6,441	7,261	5,204	9,683	2,782
1984	12,242	5,864	6,378	7,098	5,144	9,477	2,765
1985	12,247	5,818	6,429	7,075	5,172	9,479	2,768
1986	12,504	5,885	6,619	7,120	5,384	9,714	2,790
1987	12,767	5,932	6,836	7,231	5,536	9,973	2,793
1988	13,055	6,002	7,053	7,437	5,619	10,161	2,894
1989	13,458	6,155	7,302	7,627	5,830	10,515	2,943
1990*	13,931	6,419	7,512	7,828	6,103	10,844	3,087
Middle alternative projections							
1991	14,105	6,473	7,632	7,844	6,261	10,982	3,123
1992	14,235	6,516	7,719	7,871	6,364	11,083	3,152
1993	14,366	6,531	7,835	7,895	6,471	11,187	3,179
1994	14,512	6,549	7,963	7,949	6,563	11,305	3,207
1995	14,621	6,575	8,046	7,988	6,633	11,393	3,228
1996	14,803	6,647	8,156	8,095	6,708	11,537	3,266
1997	14,978	6,691	8,287	8,212	6,766	11,673	3,305
1998	15,227	6,774	8,453	8,408	6,819	11,864	3,363
1999	15,462	6,853	8,609	8,588	6,874	12,043	3,419
2000	15,692	6,922	8,770	8,770	6,922	12,220	3,472
2001	15,865	6,991	8,874	8,906	6,959	12,355	3,510
2002	16,030	7,052	8,978	9,035	6,995	12,478	3,552
Low alternative projections							
1991	13,537	6,195	7,342	7,516	6,021	10,545	2,992
1992	13,537	6,181	7,356	7,479	6,058	10,545	2,992
1993	13,595	6,173	7,422	7,477	6,118	10,592	3,003
1994	13,649	6,158	7,491	7,481	6,168	10,638	3,011
1995	13,761	6,158	7,603	7,532	6,229	10,730	3,031
1996	13,921	6,190	7,731	7,626	6,295	10,857	3,064
1997	14,117	6,237	7,880	7,751	6,366	11,010	3,107
1998	14,353	6,308	8,045	7,920	6,433	11,195	3,158
1999	14,594	6,382	8,212	8,087	6,507	11,382	3,212
2000	14,851	6,451	8,400	8,274	6,577	11,579	3,272
2001	15,050	6,525	8,525	8,415	6,635	11,733	3,317
2002	15,243	6,589	8,654	8,557	6,686	11,882	3,361
High alternative projections							
1991	14,770	6,647	8,123	8,340	6,530	11,486	3,284
1992	15,122	6,775	8,347	8,555	6,567	11,750	3,372
1993	15,316	6,858	8,458	8,593	6,723	11,905	3,411
1994	15,480	6,953	8,527	8,624	6,856	12,037	3,443
1995	15,570	6,990	8,580	8,615	6,955	12,112	3,458
1996	15,831	7,170	8,661	8,769	7,062	12,319	3,512
1997	16,047	7,287	8,760	8,873	7,174	12,488	3,559
1998	16,340	7,448	8,892	9,063	7,277	12,715	3,625
1999	16,637	7,608	9,029	9,255	7,382	12,945	3,692
2000	16,930	7,752	9,178	9,444	7,486	13,172	3,758
2001	17,168	7,902	9,266	9,600	7,568	13,354	3,814
2002	17,399	8,044	9,355	9,738	7,661	13,532	3,867

* Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 4.—Total enrollment in 4-year institutions of higher education, by sex, attendance status, and control of institution, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Sex		Attendance status		Control	
		Men	Women	Full-time	Part-time	Public	Private
1977	7,243	3,823	3,419	5,138	2,104	4,945	2,298
1978	7,232	3,755	3,476	5,109	2,122	4,912	2,320
1979	7,353	3,762	3,591	5,202	2,151	4,980	2,373
1980	7,571	3,827	3,743	5,344	2,226	5,129	2,442
1981	7,655	3,852	3,805	5,387	2,270	5,166	2,489
1982	7,654	3,861	3,793	5,381	2,273	5,176	2,478
1983	7,741	3,893	3,849	5,434	2,307	5,223	2,518
1984	7,711	3,847	3,864	5,395	2,317	5,198	2,513
1985	7,716	3,816	3,900	5,385	2,331	5,210	2,506
1986	7,824	3,824	4,000	5,423	2,401	5,300	2,524
1987	7,990	3,859	4,131	5,522	2,468	5,432	2,558
1988	8,180	3,912	4,268	5,693	2,487	5,546	2,634
1989	8,374	3,969	4,406	5,795	2,579	5,694	2,680
1990*	8,738	4,192	4,546	5,961	2,777	5,923	2,815
Middle alternative projections							
1991	8,844	4,225	4,619	5,988	2,856	5,993	2,851
1992	8,923	4,254	4,669	6,014	2,909	6,045	2,878
1993	8,990	4,260	4,730	6,028	2,962	6,088	2,902
1994	9,066	4,267	4,799	6,059	3,007	6,139	2,927
1995	9,120	4,276	4,844	6,083	3,037	6,175	2,945
1996	9,227	4,318	4,908	6,156	3,071	6,247	2,980
1997	9,334	4,344	4,99	6,242	3,092	6,320	3,014
1998	9,500	4,398	5,10	6,391	3,109	6,434	3,066
1999	9,655	4,450	5,205	6,528	3,127	6,539	3,116
2000	9,810	4,496	5,314	6,671	3,139	6,646	3,164
2001	9,927	4,544	5,383	6,778	3,149	6,727	3,200
2002	10,041	4,586	5,455	6,882	3,159	6,803	3,238
Low alternative projections							
1991	8,476	4,050	4,426	5,738	2,738	5,746	2,730
1992	8,474	4,043	4,431	5,716	2,758	5,742	2,732
1993	8,499	4,036	4,463	5,712	2,787	5,758	2,741
1994	8,518	4,020	4,498	5,707	2,811	5,770	2,748
1995	8,574	4,012	4,562	5,738	2,836	5,809	2,765
1996	8,665	4,027	4,638	5,802	2,863	5,872	2,793
1997	8,788	4,055	4,733	5,895	2,893	5,955	2,833
1998	8,937	4,100	4,837	6,021	2,916	6,059	2,878
1999	9,092	4,147	4,945	6,149	2,943	6,165	2,927
2000	9,262	4,191	5,071	6,295	2,967	6,281	2,981
2001	9,392	4,240	5,152	6,406	2,986	6,371	3,021
2002	9,523	4,283	5,240	6,520	3,003	6,461	3,062
High alternative projections							
1991	9,303	4,344	4,959	6,371	2,932	6,306	2,997
1992	9,546	4,431	5,115	6,545	3,001	6,467	3,079
1993	9,648	4,481	5,167	6,570	3,078	6,533	3,115
1994	9,731	4,540	5,191	6,587	3,144	6,587	3,144
1995	9,769	4,553	5,216	6,581	3,188	6,612	3,157
1996	9,919	4,662	5,257	6,683	3,236	6,715	3,204
1997	10,048	4,732	5,316	6,762	3,286	6,800	3,248
1998	10,233	4,835	5,398	6,904	3,329	6,926	3,307
1999	10,424	4,938	5,486	7,052	3,372	7,055	3,369
2000	10,614	5,029	5,585	7,201	3,413	7,186	3,428
2001	10,771	5,129	5,642	7,326	3,445	7,291	3,480
2002	10,923	5,222	5,701	7,440	3,483	7,394	3,529

* Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 5.—Total enrollment in 2-year institutions of higher education, by sex, attendance status, and control of institution, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Sex		Attendance status		Control	
		Men	Women	Full-time	Part-time	Public	Private
1977	4,043	1,965	2,077	1,654	2,388	3,902	141
1978	4,028	1,885	2,143	1,558	2,470	3,874	154
1979	4,217	1,924	2,294	1,591	2,627	4,057	160
1980	4,526	2,047	2,479	1,754	2,772	4,329	198
1981	4,716	2,124	2,591	1,796	2,919	4,481	236
1982	4,772	2,170	2,602	1,840	2,932	4,520	252
1983	4,723	2,131	2,592	1,827	2,897	4,459	264
1984	4,531	2,017	2,514	1,704	2,827	4,279	252
1985	4,531	2,002	2,529	1,691	2,840	4,270	261
1986	4,680	2,061	2,619	1,696	2,983	4,414	266
1987	4,776	2,073	2,703	1,709	3,068	4,541	235
1988	4,875	2,080	2,785	1,744	3,132	4,615	260
1989	5,083	2,187	2,897	1,831	3,252	4,821	263
1990*	5,193	2,227	2,966	1,867	3,326	4,921	272
Middle alternative projections							
1991	5,261	2,248	3,013	1,856	3,405	4,989	272
1992	5,312	2,262	3,050	1,857	3,455	5,038	274
1993	5,376	2,271	3,105	1,867	3,509	5,099	277
1994	5,446	2,282	3,164	1,890	3,556	5,166	280
1995	5,501	2,299	3,202	1,905	3,596	5,218	283
1996	5,576	2,329	3,247	1,939	3,637	5,290	286
1997	5,644	2,347	3,297	1,970	3,674	5,353	291
1998	5,727	2,376	3,351	2,017	3,710	5,430	297
1999	5,807	2,403	3,404	2,060	3,747	5,504	303
2000	5,882	2,426	3,456	2,099	3,783	5,574	308
2001	5,938	2,447	3,491	2,128	3,810	5,628	310
2002	5,989	2,466	3,523	2,153	3,836	5,675	314
Low alternative projections							
1991	5,061	2,145	2,916	1,778	3,283	4,799	262
1992	5,063	2,138	2,925	1,763	3,300	4,803	260
1993	5,096	2,137	2,959	1,765	3,331	4,834	262
1994	5,131	2,138	2,993	1,774	3,357	4,868	263
1995	5,187	2,146	3,041	1,794	3,393	4,921	266
1996	5,256	2,163	3,093	1,824	3,432	4,985	271
1997	5,329	2,182	3,147	1,856	3,473	5,055	274
1998	5,416	2,208	3,208	1,899	3,517	5,136	280
1999	5,502	2,235	3,267	1,938	3,564	5,217	285
2000	5,589	2,260	3,329	1,979	3,610	5,298	291
2001	5,658	2,285	3,373	2,009	3,649	5,362	296
2002	5,720	2,306	3,414	2,037	3,683	5,421	299
High alternative projections							
1991	5,467	2,303	3,164	1,969	3,498	5,180	287
1992	5,576	2,344	3,232	2,010	3,566	5,283	293
1993	5,668	2,377	3,291	2,023	3,645	5,372	296
1994	5,749	2,413	3,336	2,037	3,712	5,450	299
1995	5,801	2,437	3,364	2,034	3,767	5,500	301
1996	5,912	2,508	3,404	2,086	3,826	5,604	308
1997	5,999	2,555	3,444	2,111	3,888	5,688	311
1998	6,107	2,613	3,494	2,159	3,948	5,789	318
1999	6,213	2,670	3,543	2,203	4,010	5,891	323
2000	6,316	2,723	3,593	2,243	4,073	5,986	330
2001	6,397	2,773	3,624	2,274	4,123	6,063	334
2002	6,476	2,822	3,654	2,298	4,178	6,138	338

*Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 6.—Enrollment in all institutions of higher education, by age, sex, and attendance status, with middle alternative projections: 50 States and D.C., fall 1982, 1987, 1990, 1997, and 2002

(In thousands)

Age	1982(Estimated)			1987(Estimated)			1990(Projected)			1997(Projected)			2002(Projected)		
	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time
Total	**12,426**	**7,221**	**5,205**	**12,767**	**7,231**	**5,536**	**13,931**	**7,828**	**6,103**	**14,978**	**8,212**	**6,766**	**16,030**	**9,035**	6,995
14 to 17 years	234	210	24	237	142	95	172	141	30	196	162	34	210	174	36
18 to 19 years	2,725	2,382	343	2,847	2,488	359	2,994	2,647	347	3,010	2,637	374	3,331	2,889	442
20 to 21 years	2,539	2,084	455	2,504	2,024	480	2,553	2,101	451	2,616	2,143	473	3,055	2,471	584
22 to 24 years	2,081	1,228	853	1,989	1,223	766	2,126	1,322	804	2,208	1,375	833	2,500	1,565	935
25 to 29 years	1,995	768	1,227	1,930	693	1,237	2,073	712	1,360	2,035	666	1,369	1,890	632	1,258
30 to 34 years	1,263	300	963	1,266	293	972	1,406	362	1,044	1,371	369	1,001	1,324	368	956
35 years and over	1,589	248	1,341	1,993	367	1,626	2,605	540	2,065	3,541	858	2,683	3,723	939	2,785
Men	6,031	3,753	2,278	5,932	3,611	2,321	6,419	3,879	2,540	6,691	3,924	2,767	7,052	4,234	2,818
14 to 17 years	108	91	17	114	69	46	69	56	13	78	63	15	82	66	16
18 to 19 years	1,294	1,160	134	1,363	1,190	173	1,455	1,317	138	1,410	1,258	153	1,525	1,349	176
20 to 21 years	1,286	1,080	206	1,258	1,029	229	1,262	1,047	216	1,300	1,071	229	1,453	1,168	285
22 to 24 years	1,137	716	422	1,003	669	334	1,072	703	369	1,046	680	367	1,164	752	412
25 to 29 years	1,055	446	609	964	371	593	1,017	395	622	946	353	594	871	325	546
30 to 34 years	559	174	385	541	146	395	622	167	455	586	158	429	553	149	404
35 years and over	591	85	506	690	138	552	920	194	726	1,324	342	982	1,405	426	979
Women	6,394	3,468	2,927	6,836	3,620	3,214	7,512	3,949	3,563	8,287	4,288	3,999	8,978	4,801	4,177
14 to 17 years	126	119	7	123	73	50	102	85	17	118	99	19	128	108	20
18 to 19 years	1,431	1,222	209	1,484	1,298	186	1,540	1,330	209	1,600	1,379	221	1,806	1,540	266
20 to 21 years	1,253	1,004	248	1,246	995	251	1,290	1,055	236	1,316	1,072	244	1,602	1,302	300
22 to 24 years	943	512	431	986	554	432	1,054	619	435	1,162	696	466	1,336	813	523
25 to 29 years	940	322	618	966	323	643	1,056	318	739	1,089	313	776	1,019	307	711
30 to 34 years	704	125	578	725	147	578	784	195	589	784	212	573	771	219	552
35 years and over	998	164	835	1,303	229	1,074	1,685	347	1,338	2,217	516	1,700	2,318	513	1,806

NOTE: Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys, and U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-25, No. 1018. (This table was prepared April 1991.)

Table 7.—Enrollment in all institutions of higher education, by age, sex, and attendance status, with low alternative projections: 50 States and D.C., fall 1982, 1987, 1990, 1997, and 2002

(In thousands)

Age	1982(Estimated)			1987(Estimated)			1990(Projected)			1997(Projected)			2002(Projected)		
	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time
Total	**12,426**	**7,221**	**5,205**	**12,767**	**7,231**	**5,536**	**13,931**	**7,828**	**6,103**	**14,117**	**7,751**	**6,366**	**15,243**	**8,557**	**6,686**
14 to 17 years	234	210	24	237	142	95	172	141	30	191	157	34	202	166	36
18 to 19 years	2,725	2,382	343	2,847	2,488	359	2,994	2,647	347	2,937	2,564	374	3,231	2,789	442
20 to 21 years	2,539	2,084	455	2,504	2,024	480	2,553	2,101	451	2,557	2,084	473	3,005	2,421	584
22 to 24 years	2,081	1,228	853	1,989	1,223	766	2,126	1,322	804	2,040	1,272	768	2,357	1,468	889
25 to 29 years	1,995	768	1,227	1,930	693	1,237	2,073	712	1,360	1,816	647	1,169	1,707	605	1,102
30 to 34 years	1,263	300	963	1,266	293	972	1,406	362	1,044	1,363	362	1,001	1,313	357	956
35 years and over	1,589	248	1,341	1,993	367	1,626	2,605	540	2,065	3,214	667	2,547	3,428	751	2,678
Men	6,031	3,753	2,278	5,932	3,611	2,321	6,419	3,879	2,540	6,237	3,698	2,539	6,589	3,959	2,630
14 to 17 years	108	91	17	114	69	46	69	56	13	78	63	15	82	66	16
18 to 19 years	1,294	1,160	134	1,363	1,190	173	1,455	1,317	138	1,337	1,185	153	1,425	1,249	176
20 to 21 years	1,286	1,080	206	1,258	1,029	229	1,262	1,047	216	1,241	1,012	229	1,416	1,132	285
22 to 24 years	1,137	716	422	1,003	669	334	1,022	703	319	1,018	670	348	1,141	741	400
25 to 29 years	1,055	446	609	964	371	593	1,017	395	622	872	353	519	803	325	478
30 to 34 years	559	174	385	541	146	395	622	167	455	586	158	429	553	149	404
35 years and over	591	85	506	698	138	552	920	194	726	1,105	259	846	1,169	297	872
Women	6,394	3,468	2,927	6,836	3,620	3,214	7,512	3,949	3,563	7,880	4,053	3,827	8,654	4,598	4,056
14 to 17 years	126	119	7	123	73	50	102	85	17	114	95	19	120	100	20
18 to 19 years	1,431	1,222	209	1,484	1,298	186	1,540	1,330	209	1,600	1,379	221	1,806	1,540	266
20 to 21 years	1,253	1,004	248	1,246	995	251	1,290	1,055	236	1,315	1,072	244	1,588	1,289	300
22 to 24 years	943	512	431	986	554	432	1,054	619	435	1,022	602	420	1,217	728	489
25 to 29 years	940	322	618	966	323	643	1,056	318	739	944	294	650	904	280	624
30 to 34 years	704	125	578	725	147	578	784	195	589	777	204	573	760	208	552
35 years and over	998	164	835	1,303	229	1,074	1,685	347	1,338	2,109	409	1,700	2,259	454	1,806

NOTE: Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys, and U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-25, No. 1018. (This table was prepared April 1991.)

Table 8.—Enrollment in all institutions of higher education, by age, sex, and attendance status, with high alternative projections: 50 States and D.C., fall 1982, 1987, 1990, 1997, and 2002

(In thousands)

Age	1982(Estimated)			1987(Estimated)			1990(Projected)			1997(Projected)			2002(Projected)		
	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time
Total	**12,426**	**7,221**	**5,205**	**12,767**	**7,231**	**5,536**	**13,931**	**7,828**	**6,103**	**16,047**	**8,573**	**7,174**	**17,399**	**9,738**	**7,661**
14 to 17 years	234	210	24	237	142	95	172	141	30	209	170	39	222	179	43
18 to 19 years	2,725	2,382	343	2,847	2,488	359	2,994	2,647	347	3,170	2,796	374	3,466	3,025	442
20 to 21 years	2,539	2,084	455	2,504	2,024	480	2,553	2,101	451	2,701	2,221	480	3,109	2,512	596
22 to 24 years	2,081	1,228	853	1,989	1,223	766	2,126	1,322	804	2,620	1,650	970	2,995	1,893	1,102
25 to 29 years	1,995	768	1,227	1,930	693	1,237	2,073	712	1,360	2,344	743	1,601	2,344	749	1,596
30 to 34 years	1,263	300	963	1,266	293	972	1,406	362	1,044	1,373	372	1,001	1,328	372	956
35 years and over	1,589	248	1,341	1,993	367	1,626	2,605	540	2,065	3,631	922	2,709	3,935	1,008	2,927
Men	6,031	3,753	2,278	5,932	3,611	2,321	6,419	3,879	2,540	7,287	4,244	3,043	8,044	4,697	3,347
14 to 17 years	108	91	17	114	69	46	69	56	13	82	63	20	89	66	23
18 to 19 years	1,294	1,160	134	1,363	1,190	173	1,455	1,317	138	1,506	1,354	153	1,631	1,455	176
20 to 21 years	1,286	1,080	206	1,258	1,029	229	1,262	1,047	216	1,318	1,082	236	1,477	1,180	297
22 to 24 years	1,137	716	422	1,003	669	334	1,072	703	369	1,281	843	438	1,519	1,015	503
25 to 29 years	1,055	446	609	964	371	593	1,017	395	622	1,150	391	759	1,207	383	824
30 to 34 years	559	174	385	541	146	395	622	167	455	588	160	429	557	153	404
35 years and over	591	85	506	690	138	552	920	194	726	1,362	353	1,009	1,564	444	1,121
Women	6,394	3,468	2,927	6,836	3,620	3,214	7,512	3,949	3,563	8,760	4,629	4,131	9,355	5,041	4,314
14 to 17 years	126	119	7	123	73	50	102	85	17	126	107	19	133	113	20
18 to 19 years	1,431	1,222	209	1,484	1,298	186	1,540	1,330	209	1,664	1,443	221	1,835	1,569	266
20 to 21 years	1,253	1,004	248	1,246	995	251	1,290	1,055	236	1,383	1,140	244	1,632	1,332	300
22 to 24 years	943	512	431	986	554	432	1,054	619	435	1,339	807	532	1,476	878	598
25 to 29 years	940	322	618	966	323	643	1,056	318	739	1,194	352	842	1,138	365	772
30 to 34 years	704	125	578	725	147	578	784	195	589	784	212	573	771	219	552
35 years and over	998	164	835	1,303	229	1,074	1,685	347	1,338	2,269	569	1,700	2,371	565	1,806

NOTE: Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys, and U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-25, No. 1018. (This table was prepared April 1981.)

Table 9.—Total enrollment in all institutions of higher education, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	11,286	3,650	2,138	3,142	2,354
1978	11,260	3,527	2,113	3,140	2,479
1979	11,570	3,544	2,142	3,249	2,636
1980	12,097	3,689	2,185	3,409	2,814
1981	12,372	3,714	2,262	3,459	2,927
1982	12,426	3,753	2,278	3,468	2,927
1983	12,465	3,760	2,264	3,501	2,940
1984	12,242	3,648	2,216	3,451	2,927
1985	12,247	3,608	2,211	3,468	2,961
1986	12,504	3,599	2,285	3,521	3,098
1987	12,767	3,611	2,321	3,620	3,214
1988	13,055	3,662	2,340	3,775	3,278
1989	13,458	3,728	2,428	3,899	3,403
1990*	13,931	3,870	2,540	3,949	3,563
Middle alternative projections					
1991	14,105	3,867	2,606	3,977	3,655
1992	14,235	3,868	2,648	4,003	3,716
1993	14,366	3,855	2,676	4,040	3,795
1994	14,512	3,854	2,695	4,095	3,868
1995	14,621	3,852	2,723	4,136	3,910
1996	14,803	3,893	2,754	4,202	3,954
1997	14,978	3,924	2,767	4,[illegible]	3,999
1998	15,227	3,995	2,779	4,313	4,040
1999	15,462	4,061	2,792	4,527	4,082
2000	15,692	4,122	2,800	4,648	4,122
2001	15,865	4,183	2,808	4,723	4,151
2002	16,030	4,234	2,818	4,801	4,177
Low alternative projections					
1991	13,537	3,720	2,475	3,796	3,546
1992	13,537	3,700	2,481	3,779	3,577
1993	13,595	3,681	2,492	3,796	3,626
1994	13,649	3,660	2,498	3,821	3,670
1995	13,761	3,651	2,503	3,881	3,722
1996	13,921	3,670		3,956	3,775
1997	14,117	3,698	2,539	4,053	3,827
1998	14,353	3,755	2,553	4,165	3,880
1999	14,594	3,806	2,576	4,281	3,931
2000	14,851	3,857	2,594	4,417	3,983
2001	15,050	3,912	2,613	4,503	4,022
2002	15,243	3,959	2,630	4,598	4,056
High alternative projections					
1991	14,770	3,902	2,655	4,348	3,775
1992	15,122	4,05[illegible]	2,718	4,498	3,849
1993	15,316	4,073	2,785	4,520	3,938
1994	15,480	4,112	2,841	4,512	4,015
1995	15,570	4,084	2,906	4,531	4,049
1996	15,831	4,196	2,974	4,573	4,088
1997	16,047	4,244	3,043	4,629	4,131
1998	16,340	4,313	3,105	4,720	4,172
1999	16,637	4,440	3,168	4,815	4,214
2000	16,930	4,522	3,230	4,922	4,256
2001	17,168	4,618	3,284	4,982	4,284
2002	17,309	4,69[illegible]	3,347	5,041	4,314

*Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 10.—Total enrollment in public 4-year institutions of higher education, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	4,945	1,873	696	1,606	770
1978	4,912	1,822	687	1,613	789
1979	4,980	1,833	676	1,661	810
1980	5,129	1,873	685	1,719	851
1981	5,166	1,877	692	1,741	858
1982	5,176	1,889	698	1,734	855
1983	5,223	1,910	698	1,755	860
1984	5,198	1,880	694	1,749	874
1985	5,210	1,864	693	1,760	893
1986	5,300	1,865	706	1,792	937
1987	5,432	1,882	723	1,854	973
1988	5,546	1,910	722	1,932	982
1989	5,694	1,938	743	1,996	1,017
1990*	5,923	2,011	809	2,017	1,086
		Middle alternative projections			
1991	5,993	2,010	831	2,034	1,118
1992	6,045	2,013	846	2,047	1,139
1993	6,088	2,005	857	2,062	1,164
1994	6,139	2,002	864	2,085	1,188
1995	6,175	1,999	872	2,104	1,200
1996	6,247	2,017	882	2,136	1,212
1997	6,320	2,031	885	2,180	1,224
1998	6,434	2,067	886	2,246	1,235
1999	6,539	2,100	888	2,306	1,245
2000	6,646	2,132	888	2,372	1,254
2001	6,727	2,164	889	2,413	1,261
2002	6,803	2,191	889	2,456	1,267
		Low alternative projections			
1991	5,746	1,937	787	1,940	1,082
1992	5,742	1,928	789	1,932	1,093
1993	5,758	1,918	794	1,938	1,108
1994	5,770	1,904	796	1,948	1,122
1995	5,809	1,897	798	1,977	1,137
1996	5,872	1,905	801	2,013	1,153
1997	5,955	1,918	806	2,063	1,168
1998	6,059	1,947	809	2,121	1,182
1999	6,165	1,974	814	2,182	1,195
2000	6,281	2,001	817	2,255	1,208
2001	6,371	2,031	821	2,301	1,218
2002	6,461	2,057	825	2,352	1,227
		High alternative projections			
1991	6,306	2,075	847	2,229	1,155
1992	6,467	2,111	868	2,308	1,180
1993	6,533	2,119	892	2,313	1,209
1994	6,587	2,138	911	2,304	1,234
1995	6,612	2,125	932	2,312	1,243
1996	6,715	2,177	953	2,330	1,255
1997	6,800	2,201	975	2,358	1,266
1998	6,926	2,252	994	2,404	1,276
1999	7,058	2,302	1,012	2,454	1,287
2000	7,186	2,348	1,031	2,513	1,297
2001	7,291	2,396	1,047	2,545	1,303
2002	7,394	2,439	1,066	2,579	1,310

*Projected.

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 11.—Total enrollment in public 2-year institutions of higher education, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	3,902	805	1,089	739	1,259
1978	3,874	738	1,084	700	1,351
1979	4,057	739	1,123	728	1,468
1980	4,329	812	1,152	784	1,581
1981	4,481	827	1,192	803	1,658
1982	4,520	851	1,195	810	1,664
1983	4,489	827	1,175	807	1,650
1984	4,379	762	1,138	756	1,623
1985	4,270	743	1,138	754	1,635
1986	4,414	742	1,193	764	1,715
1987	4,541	744	1,225	787	1,785
1988	4,615	746	1,231	822	1,817
1989	4,821	785	1,282	868	1,885
1990	4,921	810	1,294	867	1,950
		Middle alternative projections			
1991	4,980	800	1,326	868	1,995
1992	5,038	795	1,345	873	2,025
1993	5,089	792	1,356	885	2,056
1994	5,166	795	1,364	902	2,105
1995	5,218	797	1,378	914	2,129
1996	5,290	810	1,393	932	2,154
1997	5,353	818	1,407	951	2,181
1998	5,430	835	1,412	976	2,207
1999	5,504	850	1,422	999	2,233
2000	5,574	863	1,431	1,021	2,259
2001	5,628	875	1,439	1,036	2,278
2002	5,675	884	1,447	1,049	2,295
		Low alternative projections			
1991	4,799	765	1,263	832	1,939
1992	4,803	757	1,265	827	1,954
1993	4,834	752	1,269	833	1,980
1994	4,868	751	1,271	842	2,004
1995	4,921	753	1,277	858	2,033
1996	4,985	760	1,285	878	2,062
1997	5,055	768	1,296	899	2,092
1998	5,130	781	1,307	924	2,124
1999	5,217	792	1,321	948	2,156
2000	5,298	803	1,334	973	2,188
2001	5,362	813	1,347	990	2,212
2002	5,421	821	1,359	1,007	2,234
		High alternative projections			
1991	5,180	826	1,351	942	2,061
1992	5,283	835	1,381	970	2,097
1993	5,372	836	1,412	981	2,143
1994	5,450	845	1,438	984	2,183
1995	5,500	835	1,471	991	2,203
1996	5,604	867	1,506	1,006	2,225
1997	5,688	877	1,541	1,019	2,251
1998	5,789	899	1,574	1,040	2,276
1999	5,890	919	1,608	1,060	2,303
2000	5,986	935	1,642	1,079	2,330
2001	6,063	952	1,672	1,090	2,349
2002	6,138	965	1,706	1,099	2,368

Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 12.—Total enrollment in private 4-year institutions of higher education, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	2,298	925	329	734	309
1978	2,320	919	327	755	319
1979	2,373	924	329	784	336
1980	2,442	936	333	816	357
1981	2,489	939	344	830	376
1982	2,478	933	341	824	380
1983	2,518	935	350	834	399
1984	2,513	926	345	839	401
1985	2,506	917	340	844	403
1986	2,524	910	343	856	415
1987	2,558	908	346	878	426
1988	2,634	933	347	918	436
1989	2,680	929	358	932	461
1990*	2,815	977	395	956	487
Middle alternative projections					
1991	2,851	978	40.	966	501
1992	2,878	981	414	973	510
1993	2,902	979	419	982	522
1994	2,927	978	423	994	532
1995	2,945	977	428	1,003	537
1996	2,980	986	433	1,017	544
1997	3,014	994	434	1,037	549
1998	3,066	1,010	435	1,068	553
1999	3,116	1,026	436	1,096	558
2000	3,164	1,041	435	1,126	562
2001	3,200	1,057	434	1,144	565
2002	3,238	1,071	435	1,164	568
Low alternative projections					
1991	2,730	942	384	919	485
1992	2,732	940	386	916	490
1993	2,741	936	388	920	497
1994	2,748	930	390	925	503
1995	2,765	926	391	938	510
1996	2,793	929	392	955	517
1997	2,833	936	395	978	524
1998	2,878	949	395	1,004	530
1999	2,927	961	398	1,032	536
2000	2,981	973	400	1,066	542
2001	3,021	987	401	1,087	546
2002	3,062	999	402	1,112	549
High alternative projections					
1991	2,997	1,009	413	1,058	517
1992	3,079	1,028	424	1,098	529
1993	3,115	1,035	435	1,103	542
1994	3,144	1,045	436	1,100	553
1995	3,157	1,041	455	1,103	558
1996	3,204	1,066	466	1,110	562
1997	3,248	1,079	477	1,124	568
1998	3,307	1,103	486	1,145	573
1999	3,369	1,128	496	1,168	577
2000	3,428	1,149	504	1,194	581
2001	3,480	1,175	511	1,210	584
2002	3,529	1,197	520	1,225	587

* Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 13.—Total enrollment in private 2-year institutions of higher education, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	141	47	14	63	16
1978	154	48	15	72	20
1979	160	48	14	76	22
1980	198	68	15	90	24
1981	236	71	34	95	35
1982	252	80	45	99	28
1983	264	88	41	105	30
1984	252	79	37	106	29
1985	261	84	38	110	30
1986	266	83	43	108	32
1987	235	76	30	102	29
1988	260	73	40	103	44
1989	263	75	45	103	40
1990*	272	81	42	109	40
Middle alternative projections					
1991	272	79	43	109	41
1992	274	79	43	110	42
1993	277	79	44	111	43
1994	280	79	44	114	43
1995	283	79	45	115	44
1996	286	80	45	117	44
1997	291	81	45	120	45
1998	297	83	46	123	45
1999	303	85	46	126	46
2000	308	86	46	129	47
2001	310	87	46	130	47
2002	314	88	47	132	47
Low alternative projections					
1991	262	76	41	105	40
1992	260	75	41	104	40
1993	262	75	41	105	41
1994	263	75	41	106	41
1995	266	75	41	108	42
1996	271	76	42	110	43
1997	274	76	42	113	43
1998	280	78	42	116	44
1999	285	79	43	119	44
2000	291	80	43	123	45
2001	296	81	44	125	46
2002	299	82	44	127	46
High alternative projections					
1991	287	82	44	119	42
1992	293	83	45	122	43
1993	296	83	46	123	44
1994	299	84	46	124	45
1995	301	83	48	125	45
1996	308	86	49	127	46
1997	311	87	50	128	46
1998	318	89	51	131	47
1999	323	91	52	133	47
2000	330	93	53	136	48
2001	334	95	54	137	48
2002	338	96	55	138	49

*Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 14.—Undergraduate enrollment in all institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	9,717	3,188	1,709	2,906	1,914
1978	9,691	3,072	1,694	2,895	2,030
1979	9,998	3,087	1,734	2,993	2,185
1980	10,475	3,227	1,773	3,135	2,340
1981	10,755	3,261	1,848	3,188	2,458
1982	10,825	3,299	1,871	3,184	2,470
1983	10,846	3,304	1,854	3,210	2,478
1984	10,618	3,195	1,812	3,153	2,459
1985	10,597	3,156	1,806	3,163	2,471
1986	10,798	3,146	1,871	3,206	2,575
1987	11,046	3,164	1,905	3,299	2,677
1988	11,317	3,206	1,931	3,436	2,743
1989	11,666	3,267	2,011	3,542	2,846
1990*	11,969	3,387	2,061	3,566	2,955
Middle alternative projections					
1991	12,084	3,365	2,112	3,579	3,028
1992	12,165	3,357	2,143	3,589	3,076
1993	12,247	3,335	2,163	3,609	3,140
1994	12,356	3,331	2,175	3,652	3,198
1995	12,449	3,327	2,196	3,693	3,233
1996	12,610	3,363	2,219	3,759	3,269
1997	12,768	3,388	2,230	3,842	3,308
1998	12,998	3,452	2,242	3,960	3,344
1999	13,216	3,511	2,255	4,069	3,381
2000	13,436	3,565	2,265	4,188	3,418
2001	13,598	3,619	2,275	4,260	3,444
2002	13,748	3,661	2,286	4,333	3,468
Low alternative projections					
1991	11,614	3,234	2,008	3,434	2,938
1992	11,593	3,210	2,012	3,409	2,962
1993	11,622	3,184	2,018	3,418	3,002
1994	11,665	3,165	2,022	3,441	3,037
1995	11,764	3,158	2,028	3,498	3,080
1996	11,912	3,179	2,039	3,571	3,123
1997	12,080	3,205	2,055	3,663	3,167
1998	12,311	3,260	2,068	3,770	3,213
1999	12,535	3,308	2,089	3,880	3,258
2000	12,776	3,357	2,106	4,009	3,304
2001	12,960	3,408	2,124	4,089	3,339
2002	13,136	3,450	2,141	4,175	3,370
High alternative projections					
1991	12,666	3,474	2,153	3,910	3,129
1992	12,942	3,523	2,203	4,028	3,188
1993	13,064	3,523	2,255	4,027	3,259
1994	13,185	3,550	2,297	4,017	3,321
1995	13,246	3,513	2,349	4,035	3,349
1996	13,479	3,616	2,403	4,079	3,381
1997	13,662	3,653	2,458	4,133	3,418
1998	13,923	3,738	2,509	4,222	3,454
1999	14,185	3,821	2,561	4,312	3,491
2000	14,451	3,892	2,613	4,416	3,530
2001	14,658	3,972	2,659	4,472	3,555
2002	14,855	4,035	2,712	4,525	3,583

*Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 15.—Undergraduate enrollment in public institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	7,842	2,413	1,524	2,197	1,708
1978	7,786	2,302	1,510	2,161	1,813
1979	8,046	2,316	1,551	2,229	1,952
1980	8,441	2,426	1,588	2,334	2,093
1981	8,648	2,452	1,639	2,373	2,185
1982	8,713	2,487	1,653	2,373	2,201
1983	8,697	2,482	1,635	2,385	2,195
1984	8,494	2,390	1,600	2,325	2,179
1985	8,478	2,357	1,596	2,331	2,193
1986	8,661	2,351	1,652	2,367	2,291
1987	8,919	2,375	1,701	2,449	2,393
1988	9,103	2,399	1,714	2,550	2,439
1989	9,425	2,463	1,781	2,650	2,531
1990*	9,646	2,544	1,822	2,654	2,626
Middle alternative projections					
1991	9,747	2,527	1,867	2,663	2,690
1992	9,818	2,520	1,895	2,671	2,732
1993	9,892	2,504	1,912	2,688	2,788
1994	9,987	2,502	1,923	2,721	2,841
1995	10,065	2,500	1,941	2,752	2,872
1996	10,196	2,528	1,962	2,802	2,904
1997	10,322	2,547	1,973	2,863	2,939
1998	10,501	2,596	1,983	2,950	2,972
1999	10,670	2,640	1,995	3,030	3,005
2000	10,841	2,681	2,005	3,117	3,038
2001	10,969	2,721	2,015	3,171	3,062
2002	11,084	2,752	2,024	3,224	3,084
Low alternative projections					
1991	9,370	2,428	1,776	2,555	2,611
1992	9,357	2,409	1,779	2,537	2,632
1993	9,386	2,390	1,785	2,544	2,667
1994	9,425	2,376	1,788	2,562	2,699
1995	9,508	2,372	1,794	2,605	2,737
1996	9,627	2,388	1,804	2,660	2,775
1997	9,769	2,408	1,818	2,728	2,815
1998	9,944	2,449	1,831	2,808	2,856
1999	10,120	2,485	1,849	2,889	2,897
2000	10,308	2,522	1,865	2,983	2,938
2001	10,452	2,560	1,881	3,042	2,969
2002	10,591	2,591	1,897	3,105	2,998
High alternative projections					
1991	10,200	2,689	1,903	2,908	2,780
1992	10,419	2,645	1,947	2,996	2,831
1993	10,530	2,645	1,993	2,998	2,894
1994	10,636	2,666	2,030	2,991	2,949
1995	10,693	2,638	2,076	3,005	2,974
1996	10,883	2,717	2,124	3,039	3,003
1997	11,033	2,745	2,173	3,079	3,036
1998	11,241	2,810	2,218	3,145	3,068
1999	11,450	2,872	2,264	3,212	3,102
2000	11,661	2,925	2,311	3,288	3,137
2001	11,825	2,984	2,352	3,329	3,160
2002	11,983	3,031	2,399	3,368	3,185

* Projected.

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 16.—Undergraduate enrollment in private institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	1,872	775	184	708	205
1978	1,905	770	184	734	217
1979	1,951	772	184	762	233
1980	2,033	800	185	801	246
1981	2,106	809	209	816	272
1982	2,112	812	219	811	270
1983	2,149	823	219	824	283
1984	2,124	805	212	827	280
1985	2,120	800	210	832	278
1986	2,137	796	219	839	284
1987	2,128	788	204	850	286
1988	2,213	807	217	886	304
1989	2,241	804	230	892	315
1990*	2,323	843	239	912	329
Middle alternative projections					
1991	2,337	838	245	916	338
1992	2,347	837	248	918	344
1993	2,355	831	251	921	352
1994	2,369	829	252	931	357
1995	2,384	827	255	941	361
1996	2,414	835	257	957	365
1997	2,446	841	257	979	369
1998	2,497	856	259	1,010	372
1999	2,546	871	260	1,039	376
2000	2,595	884	260	1,071	380
2001	2,629	898	260	1,089	382
2002	2,664	909	262	1,109	384
Low alternative projections					
1991	2,244	806	232	879	327
1992	2,236	801	233	872	330
1993	2,236	794	233	874	335
1994	2,240	789	234	879	338
1995	2,256	786	234	893	343
1996	2,285	791	235	911	348
1997	2,321	797	237	928	352
1998	2,367	811	237	962	357
1999	2,415	823	240	991	361
2000	2,468	835	241	1,026	366
2001	2,508	848	243	1,047	370
2002	2,545	859	244	1,070	372
High alternative projections					
1991	2,466	865	250	1,002	349
1992	2,523	878	256	1,042	357
1993	2,534	878	262	1,029	365
1994	2,549	884	267	1,026	372
1995	2,553	875	273	1,030	378
1996	2,596	899	279	1,040	378
1997	2,629	908	285	1,084	382
1998	2,682	928	291	1,077	386
1999	2,735	949	297	1,100	389
2000	2,790	967	302	1,128	393
2001	2,833	988	307	1,144	395
2002	2,872	1,004	313	1,163	398

*Projected.

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Post-secondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 17.—Graduate enrollment in all institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	1,319	289	411	184	434
1978	1,312	280	402	188	442
1979	1,309	280	389	196	444
1980	1,343	281	394	204	466
1981	1,343	277	397	207	462
1982	1,322	280	380	205	447
1983	1,340	286	391	211	452
1984	1,345	286	386	215	459
1985	1,376	289	388	220	479
1986	1,435	293	399	228	514
1987	1,452	294	400	233	525
1988	1,472	304	393	249	526
1989	1,518	309	401	263	547
1990*	1,662	325	460	280	597
Middle alternative projections					
1991	1,712	331	475	291	615
1992	1,752	337	485	303	627
1993	1,793	343	493	315	642
1994	1,826	345	500	324	657
1995	1,842	347	507	324	664
1996	1,859	350	514	324	671
1997	1,872	353	516	326	677
1998	1,888	358	516	332	682
1999	1,901	363	516	335	687
2000	1,908	367	514	337	690
2001	1,915	372	512	338	693
2002	1,926	378	511	342	695
Low alternative projections					
1991	1,631	320	449	265	597
1992	1,647	323	450	271	603
1993	1,672	328	455	277	612
1994	1,681	326	457	277	621
1995	1,694	325	460	280	629
1996	1,707	324	462	282	639
1997	1,722	325	465	285	647
1998	1,735	326	466	289	654
1999	1,749	328	468	293	660
2000	1,763	330	469	298	666
2001	1,775	333	470	303	669
2002	1,787	336	470	309	672
High alternative projections					
1991	1,777	342	482	320	633
1992	1,838	352	495	343	648
1993	1,899	363	509	361	666
1994	1,935	371	523	361	680
1995	1,961	377	536	362	686
1996	1,986	383	549	361	693
1997	2,014	390	563	362	699
1998	2,038	399	572	364	704
1999	2,067	408	583	367	709
2000	2,090	415	593	370	712
2001	2,114	426	600	376	715
2002	2,142	437	610	378	717

* Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 18.—Graduate enrollment in public institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	980	190	267	124	319
1978	894	183	258	127	326
1979	884	182	246	133	325
1980	900	180	245	137	337
1981	887	177	242	138	329
1982	870	180	237	136	317
1983	872	184	235	140	313
1984	870	182	229	142	317
1985	891	181	232	144	333
1986	941	188	244	150	358
1987	945	185	244	152	364
1988	949	193	236	163	357
1989	978	195	242	171	369
1990[1]	1,075	206	278	183	408
Middle alternative projections					
1991	1,108	210	287	190	421
1992	1,134	214	293	198	429
1993	1,160	217	298	206	439
1994	1,182	219	302	212	449
1995	1,192	220	306	212	454
1996	1,204	222	311	212	459
1997	1,212	224	312	213	463
1998	1,223	227	312	217	467
1999	1,231	230	312	219	470
2000	1,236	233	311	220	472
2001	1,241	236	310	221	474
2002	1,248	240	309	224	475
Low alternative projections					
1991	1,055	203	271	173	408
1992	1,067	205	272	177	413
1993	1,083	208	275	181	419
1994	1,089	207	276	181	425
1995	1,097	206	278	183	430
1996	1,106	206	279	184	437
1997	1,115	206	281	186	442
1998	1,125	207	282	189	447
1999	1,134	208	283	192	451
2000	1,142	209	283	195	455
2001	1,151	211	284	198	458
2002	1,159	213	284	202	460
High alternative projections					
1991	1,151	217	292	209	433
1992	1,189	223	299	224	443
1993	1,229	230	308	236	455
1994	1,252	235	316	236	465
1995	1,269	239	324	237	469
1996	1,285	243	332	236	474
1997	1,302	247	340	237	478
1998	1,318	253	346	238	481
1999	1,336	259	352	240	485
2000	1,350	263	358	242	487
2001	1,366	270	363	244	489
2002	1,383	277	369	247	490

[1] Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 19.—Graduate enrollment in private institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	416	98	144	59	115
1978	418	97	144	61	116
1979	424	98	144	63	119
1980	442	100	147	67	128
1981	456	100	155	69	132
1982	453	100	153	69	131
1983	468	103	156	71	138
1984	476	104	156	75	142
1985	486	108	156	76	147
1986	494	106	155	78	156
1987	507	108	156	82	161
1988	522	111	157	86	168
1989	541	113	159	91	177
1990[1]	587	119	182	97	189
Middle alternative projections					
1991	604	121	188	101	194
1992	618	123	192	105	198
1993	633	126	195	109	203
1994	644	126	198	112	208
1995	650	127	201	112	210
1996	655	128	203	112	212
1997	660	129	204	113	214
1998	665	131	204	115	215
1999	670	133	204	116	217
2000	672	134	203	117	218
2001	674	136	202	117	219
2002	678	138	202	118	220
Low alternative projections					
1991	576	117	178	92	189
1992	580	118	178	94	190
1993	589	120	180	96	193
1994	592	119	181	96	196
1995	597	119	182	97	199
1996	601	118	183	98	202
1997	607	119	184	99	205
1998	610	119	184	100	207
1999	615	120	185	101	209
2000	621	121	186	103	211
2001	624	122	186	105	211
2002	628	123	186	107	212
High alternative projections					
1991	626	125	190	111	200
1992	649	129	196	119	205
1993	670	133	201	125	211
1994	683	136	207	125	215
1995	692	138	212	125	217
1996	701	140	217	125	219
1997	712	143	223	125	221
1998	721	146	226	126	223
1999	731	149	231	127	224
2000	740	152	235	128	225
2001	748	156	237	129	226
2002	759	160	241	131	227

[1] Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 20.—First-professional enrollment in all institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	251	173	18	53	7
1978	257	175	17	58	7
1979	263	176	17	63	7
1980	278	181	18	70	9
1981	275	175	18	73	9
1982	278	174	17	78	9
1983	279	169	19	81	10
1984	279	166	19	83	10
1985	274	162	17	84	10
1986	270	159	15	87	9
1987	268	154	16	88	10
1988	267	151	16	90	10
1989	274	152	16	95	10
1990*	300	167	19	103	11
Middle alternative projections					
1991	309	171	19	107	12
1992	318	174	20	111	13
1993	326	177	20	116	13
1994	330	178	20	119	13
1995	330	178	20	119	13
1996	334	180	21	119	14
1997	338	183	21	120	14
1998	341	185	21	121	14
1999	345	187	21	123	14
2000	348	190	21	123	14
2001	352	192	21	125	14
2002	356	195	21	126	14
Low alternative projections					
1991	292	166	18	97	11
1992	297	167	19	99	12
1993	301	169	19	101	12
1994	303	169	19	103	12
1995	303	168	19	103	13
1996	302	167	19	103	13
1997	305	168	19	105	13
1998	307	169	19	106	13
1999	310	170	19	108	13
2000	312	170	19	110	13
2001	315	171	19	111	14
2002	320	173	19	114	14
High alternative projections					
1991	327	176	20	118	13
1992	342	182	20	127	13
1993	353	187	21	132	13
1994	360	191	21	134	14
1995	363	194	21	134	14
1996	366	197	22	133	14
1997	371	201	22	134	14
1998	378	206	24	134	14
1999	385	211	24	136	14
2000	389	215	24	136	14
2001	396	220	25	137	14
2002	402	225	25	138	14

*Projected.

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 21.—First-professional enrollment in public institutions, by sex and attendance status, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	103	75	4	24	2
1978	105	75	3	25	1
1979	106	74	2	27	1
1980	114	79	4	32	2
1981	112	75	3	33	2
1982	113	73	3	35	2
1983	113	71	3	37	2
1984	114	70	3	38	2
1985	111	69	3	38	2
1986	112	67	3	39	2
1987	110	65	3	40	2
1988	109	64	2	41	2
1989	113	65	2	43	2
1990*	123	71	3	47	2
Middle alternative projections					
1991	127	73	3	49	2
1992	131	74	3	51	3
1993	135	76	3	53	3
1994	136	76	3	54	3
1995	136	76	3	54	3
1996	137	77	3	54	3
1997	139	78	3	55	3
1998	140	79	3	55	3
1999	142	80	3	56	3
2000	143	81	3	56	3
2001	145	82	3	57	3
2002	146	83	3	57	3
Low alternative projections					
1991	120	71	3	44	2
1992	121	71	3	45	2
1993	123	72	3	46	2
1994	124	72	3	47	2
1995	125	72	3	47	3
1996	124	71	3	47	3
1997	126	72	3	48	3
1998	126	72	3	48	3
1999	128	73	3	49	3
2000	129	73	3	50	3
2001	130	73	3	51	3
2002	132	74	3	52	3
High alternative projections					
1991	135	75	3	54	3
1992	142	78	3	58	3
1993	146	80	3	60	3
1994	149	82	3	61	3
1995	150	83	3	61	3
1996	151	84	3	61	3
1997	153	86	3	61	3
1998	156	88	4	61	3
1999	159	90	4	62	3
2000	161	92	4	62	3
2001	163	94	4	62	3
2002	166	96	4	63	3

* Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities survey and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 22.—First-professional enrollment in private institutions, by sex and attendance status, with alternative projections: 50 states and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
1977	148	99	15	30	5
1978	152	100	14	32	6
1979	157	102	15	35	6
1980	163	104	16	35	7
1981	162	101	14	40	7
1982	165	101	14	43	7
1983	165	97	16	44	8
1984	164	96	16	43	8
1985	162	93	14	46	8
1986	158	91	12	48	7
1987	158	88	14	48	8
1988	158	87	14	49	8
1989	161	87	1	52	9
1990*	177	96		56	9
Middle alternative projections					
1991	182	98	16	58	10
1992	187	100	17	60	10
1993	191	101	17	63	10
1994	194	102	17	65	10
1995	194	102	17	65	10
1996	197	103	18	65	11
1997	199	105	18	65	11
1998	201	106	18	66	11
1999	203	107	18	67	11
2000	205	109	18	67	11
2001	207	110	18	68	11
2002	210	112	18	69	11
Low alternative projections					
1991	172	95	15	53	9
1992	176	96	16	54	10
1993	178	97	16	55	10
1994	179	97	16	56	10
1995	178	96	16	56	10
1996	178	96	16	56	10
1997	179	96	16	57	10
1998	181	97	16	58	10
1999	182	97	16	59	10
2000	183	97	16	60	10
2001	185	98	16	60	11
2002	188	99	16	62	11
High alternative projections					
1991	192	101	17	64	10
1992	200	104	17	69	10
1993	207	107	18	72	10
1994	211	109	18	73	11
1995	213	111	18	73	11
1996	215	113	19	72	11
1997	218	115	19	73	11
1998	222	118	20	73	11
1999	226	121	20	74	11
2000	228	123	20	74	11
2001	233	126	21	75	11
2002	236	129	21	75	11

*Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 23.—Full-time-equivalent enrollment in all institutions of higher education, by level of student and type of institution, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Undergraduate		Graduate	First-professional
		4-year	2-year	4-year	4-year
1977	8,415	4,919	2,480	776	240
1978	8,348	4,906	2,416	779	248
1979	8,487	4,989	2,471	778	249
1980	8,819	5,109	2,658	790	263
1981	9,015	5,188	2,765	801	262
1982	9,092	5,193	2,843	790	266
1983	9,166	5,254	2,841	805	266
1984	8,952	5,215	2,659	814	263
1985	8,943	5,204	2,649	829	261
1986	9,064	5,241	2,704	859	259
1987	9,230	5,363	2,743	868	256
1988	9,467	5,517	2,802	892	256
1989	9,734	5,621	2,930	919	263
1990*	10,033	5,761	2,991	995	286
Middle alternative projections					
1991	10,106	5,781	3,006	1,024	295
1992	10,171	5,794	3,024	1,050	303
1993	10,232	5,793	3,052	1,076	311
1994	10,321	5,819	3,091	1,096	315
1995	10,385	5,847	3,120	1,103	315
1996	10,519	5,922	3,168	1,111	318
1997	10,656	6,004	3,211	1,119	322
1998	10,871	6,144	3,270	1,132	325
1999	11,070	6,274	3,326	1,141	329
2000	11,230	6,413	3,377	1,148	332
2001	11,418	6,513	3,415	1,154	336
2002	11,561	6,602	3,449	1,165	340
Low alternative projections					
1991	9,691	5,554	2,887	971	279
1992	9,668	5,525	2,878	982	283
1993	9,687	5,512	2,890	998	287
1994	9,709	5,512	2,908	1,000	289
1995	9,781	5,547	2,940	1,006	288
1996	9,909	5,617	2,983	1,012	288
1997	10,050	5,711	3,029	1,020	290
1998	10,243	5,836	3,087	1,028	292
1999	10,436	5,962	3,142	1,037	295
2000	10,647	6,106	3,198	1,046	297
2001	10,810	6,212	3,242	1,056	300
2002	10,970	6,318	3,281	1,066	305
High alternative projections					
1991	10,663	6,127	3,151	1,073	312
1992	10,928	6,270	3,215	1,116	327
1993	11,021	6,273	3,254	1,157	337
1994	11,101	6,291	3,291	1,175	344
1995	11,128	6,285	3,307	1,189	347
1996	11,321	6,391	3,379	1,202	349
1997	11,464	6,469	3,424	1,217	354
1998	11,693	6,598	3,493	1,233	361
1999	11,923	6,746	3,558	1,251	368
2000	12,149	6,892	3,619	1,266	372
2001	12,334	7,005	3,667	1,284	378
2002	12,504	7,107	3,709	1,304	384

*Projected.

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 24.—Full-time-equivalent enrollment in public institutions of higher education, by level of student and type of institution, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Undergraduate		Graduate	First-professional
		4-year	2-year	4-year	4-year
1977	6,396	3,416	2,357	523	101
1978	6,279	3,375	2,283	519	101
1979	6,393	3,438	2,333	519	103
1980	6,642	3,524	2,484	522	113
1981	6,781	3,575	2,573	524	110
1982	6,851	3,597	2,630	514	110
1983	6,881	3,635	2,616	520	111
1984	6,685	3,605	2,447	521	111
1985	6,668	3,601	2,428	529	110
1986	6,778	3,629	2,483	556	110
1987	6,938	3,731	2,542	557	108
1988	7,097	3,827	2,592	571	107
1989	7,337	3,920	2,718	587	112
1990[1]	7,529	4,003	2,768	637	121
Middle alternative projections					
1991	7,583	4,017	2,785	656	125
1992	7,628	4,026	2,801	673	128
1993	7,675	4,026	2,827	690	132
1994	7,743	4,044	2,863	703	133
1995	7,794	4,064	2,890	707	133
1996	7,897	4,115	2,935	713	134
1997	7,989	4,172	2,974	717	136
1998	8,161	4,270	3,028	726	137
1999	8,308	4,359	3,078	732	139
2000	8,456	4,455	3,125	736	140
2001	8,569	4,525	3,161	741	142
2002	8,672	4,590	3,191	748	143
Low alternative projections					
1991	7,274	3,860	2,674	622	118
1992	7,254	3,839	2,666	630	119
1993	7,268	3,830	2,677	640	121
1994	7,288	3,830	2,694	642	122
1995	7,346	3,855	2,724	645	122
1996	7,436	3,903	2,763	649	121
1997	7,550	3,967	2,806	654	123
1998	7,697	4,055	2,859	660	123
1999	7,842	4,142	2,909	666	125
2000	7,999	4,242	2,960	671	126
2001	8,120	4,316	3,000	677	127
2002	8,238	4,389	3,036	684	129
High alternative projections					
1991	7,993	4,258	2,915	688	132
1992	8,184	4,356	2,974	715	139
1993	8,256	4,359	3,012	742	143
1994	8,317	4,371	3,046	754	146
1995	8,339	4,368	3,061	763	147
1996	8,488	4,442	3,127	771	148
1997	8,596	4,495	3,171	780	150
1998	8,767	4,591	3,233	790	153
1999	8,939	4,687	3,294	802	156
2000	9,108	4,790	3,349	811	158
2001	9,244	4,868	3,394	822	160
2002	9,371	4,939	3,434	835	163

[1] Projected

NOTE: Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Table 25.—Full-time-equivalent enrollment in private institutions of higher education, by level of student and type of institution, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total	Undergraduate		Graduate	First-professional
		4-year	2-year	4-year	4-year
1977	2,019	1,503	123	253	139
1978	2,069	1,531	133	259	146
1979	2,095	1,552	138	259	146
1980	2,177	1,585	174	268	150
1981	2,233	1,612	192	277	152
1982	2,241	1,596	213	276	156
1983	2,285	1,619	226	285	155
1984	2,267	1,610	212	293	152
1985	2,276	1,603	221	300	151
1986	2,286	1,613	221	303	149
1987	2,292	1,632	201	311	148
1988	2,370	1,690	210	321	149
1989	2,397	1,701	213	332	151
1990*	2,504	1,758	223	357	166
		Middle alternative projections			
1991	2,524	1,764	222	368	170
1992	2,543	1,768	223	377	175
1993	2,558	1,767	225	387	179
1994	2,578	1,775	228	393	182
1995	2,592	1,784	230	396	182
1996	2,622	1,807	233	398	184
1997	2,656	1,832	237	401	186
1998	2,712	1,875	243	406	188
1999	2,763	1,915	248	410	190
2000	2,813	1,957	252	412	192
2001	2,850	1,988	254	414	194
2002	2,889	2,017	258	417	197
		Low alternative projections			
1991	2,418	1,694	214	349	161
1992	2,414	1,686	212	352	164
1993	2,418	1,681	213	358	166
1994	2,422	1,682	214	359	167
1995	2,435	1,692	216	361	166
1996	2,463	1,714	220	363	166
1997	2,499	1,743	223	366	167
1998	2,547	1,781	229	368	169
1999	2,594	1,820	233	371	170
2000	2,648	1,864	238	375	171
2001	2,690	1,897	242	378	173
2002	2,732	1,929	245	382	176
		High alternative projections			
1991	2,671	1,870	236	385	180
1992	2,743	1,914	240	401	188
1993	2,766	1,915	242	415	194
1994	2,785	1,920	245	422	198
1995	2,790	1,918	245	427	200
1996	2,832	1,949	251	431	201
1997	2,869	1,974	254	437	204
1998	2,925	2,015	259	443	208
1999	2,983	2,058	264	449	212
2000	3,041	2,102	270	455	214
2001	3,091	2,138	273	462	218
2002	3,134	2,168	276	469	221

*Projected

NOTE: Projections are based on data through 1989/8. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities surveys and Integrated Postsecondary Education Data System (IPEDS) surveys. (This table was prepared April 1991.)

Chapter 3

High School Graduates

The number of high school graduates is projected to decline from 1989-90 through 1991–92, fluctuate, and then increase through 2001–2002. The decrease and increase in the number of high school graduates reflect changes in the 18-year-old population during the same period (figure 27). Increases in the number of graduates are expected for both public and private schools.

For high school graduates statistics, the following tabulations show (1) the average growth rate (in percent) for 1976–77 to 1989–90 and the projected growth rate for 1989–90 to 2001–2002 and (2) the growth rates for 1976–77 to 1983–84 and 1983–84 to 1989–90 and the projected growth rates for 1989–90 to 1995–96 and 1995–96 to 2001–2002.

Average annual rate of growth (in percent)

	1976–77 to 1989–90	Projected: 1989–90 to 2001–2002
Total	1.5	0.9
Public	1.5	0.9
Private	1.2	0.9

Average annual rate of growth (in percent)

	1976–77 to 1983–84	1983–84 to 1989–90	Projected: 1989–90 to 1995–96	Projected: 1995–96 to 2001–2002
Total	1.9	1.1	0.1	1.6
Public	1.8	1.2	0.1	1.6
Private	2.1	0.2	0.1	1.7

Total High School Graduates

The number of high school graduates from public and private schools decreased from 3.2 million in 1976–77 to 2.6 million in 1985–86 (table 26 and figure 28). After 1985–86, this number increased to 2.8 million in 1987–88. Then, it decreased to 2.6 million in 1989–90, a decrease of 18 percent from 1976–77, or an average annual rate of decline of 1.5 percent. Over the projection period, the total number of high school graduates is expected to fluctuate and then decrease to 2.5 million in 1993–94. Thereafter, it is projected to rise to 2.9 million by 2001–2002, an increase of 11 percent from 1989–90, or an average annual growth rate of 0.9 percent. During the projection period, the growth rate will be lower in the first half of the projection period (1989–90 to 1995–96) than in the second half (1995–96 to 2001–2002), 0.1 percent versus 1.6 percent.

High School Graduates, by Control of Institution

The number of graduates of public high schools decreased from 2.8 million in 1976–77 to 2.4 million in 1985–86 (figure 29). Then, it increased to 2.5 million 1987–88 before declining to 2.3 million in 1989–90, a decrease of 18 percent from 1976–77, or an average annual rate of decline of 1.5 percent. Over the projection period, public high school graduates are projected to fluctuate and then decrease to 2.2 million in 1993–94. Thereafter, this number is expected to increase to 2.6 million by 2001–2002, an increase of 11 percent from 1989–90, or an average annual growth rate of 0.9 percent. During the projection period, the growth rate will be lower in the first half of the projection period (1989–90 to 1995–96) than in the second half (1995–96 to 2001–2002), 0.1 percent versus 1.6 percent (figure 30).

The number of graduates of private high schools is projected to decrease from 268,000 in 1989–90 to 253,000 in 1991–92 and then increase to 304,000 in 2000–2001, before falling to 298,000 by 2001–2002, an increase of 11 percent from 1989–90, or an average annual growth rate of 0.9 percent. During the projection period, the growth rate will be lower in the first half of the projection period (1989–90 to 1995–96) than in the second half (1995–96 to 2001–2002), 0.1 percent versus 1.7 percent.

Figure 27

18-year-old population, with projections: 1977 to 2002

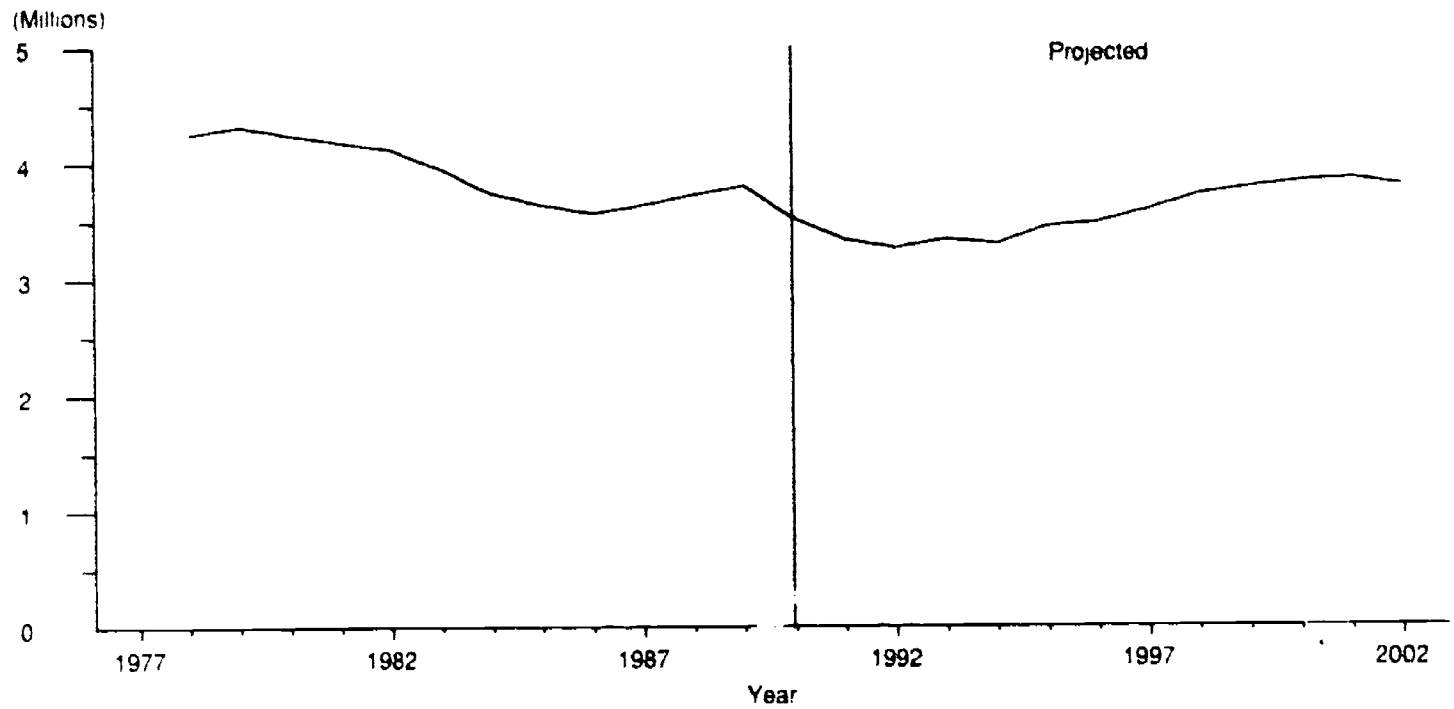


Figure 28

High school graduates, with projections: 1976-77 to 2001-2002

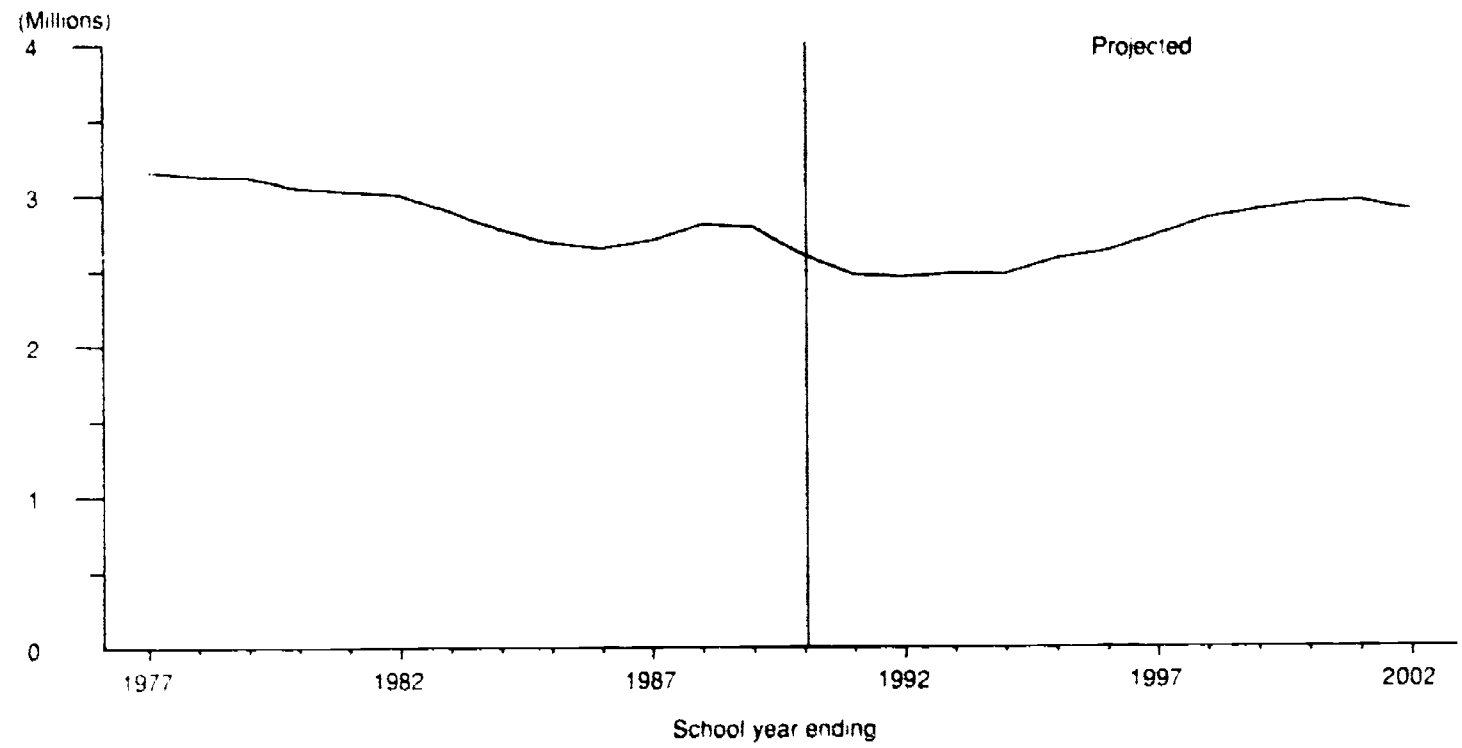


Figure 29

High school graduates, by control of institution, with projections: 1976-77 to 2001-2002

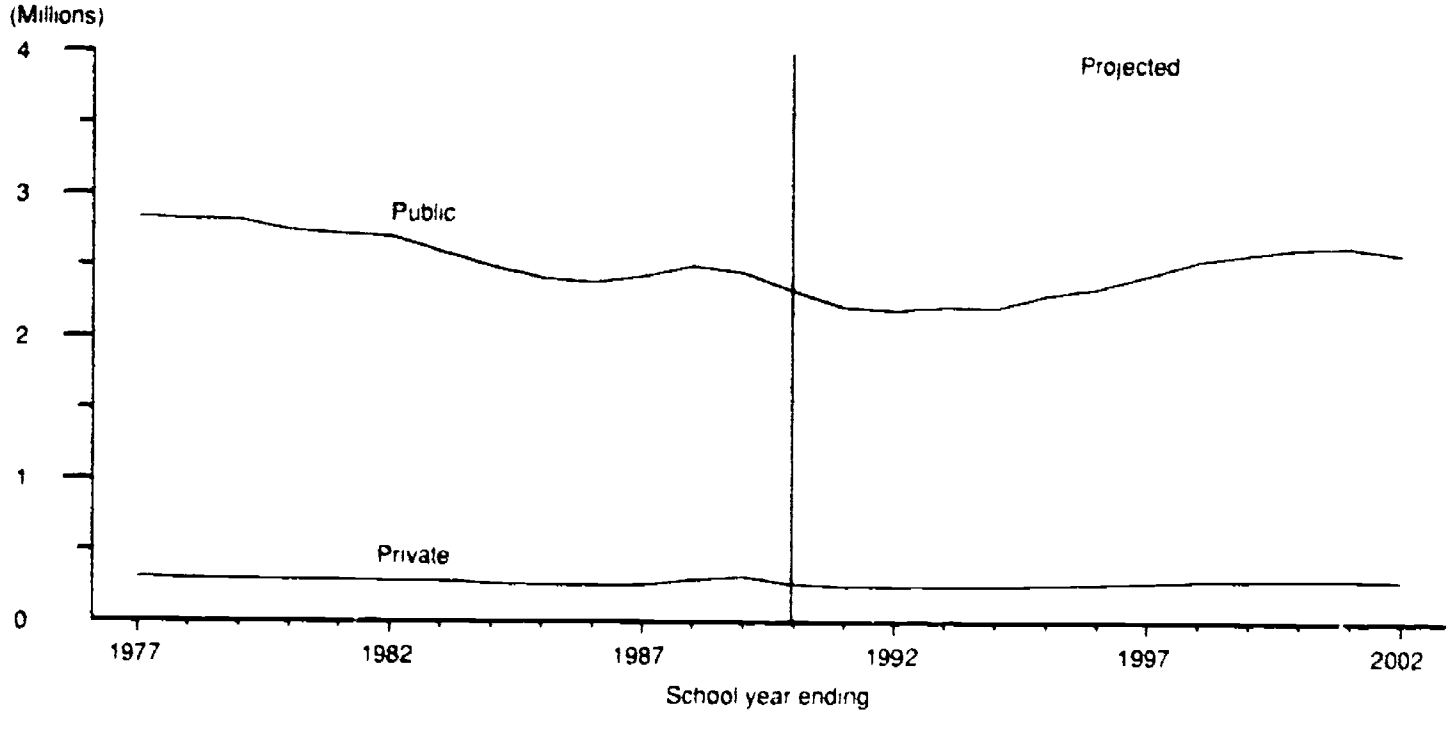


Figure 30

Average annual growth rates for high school graduates

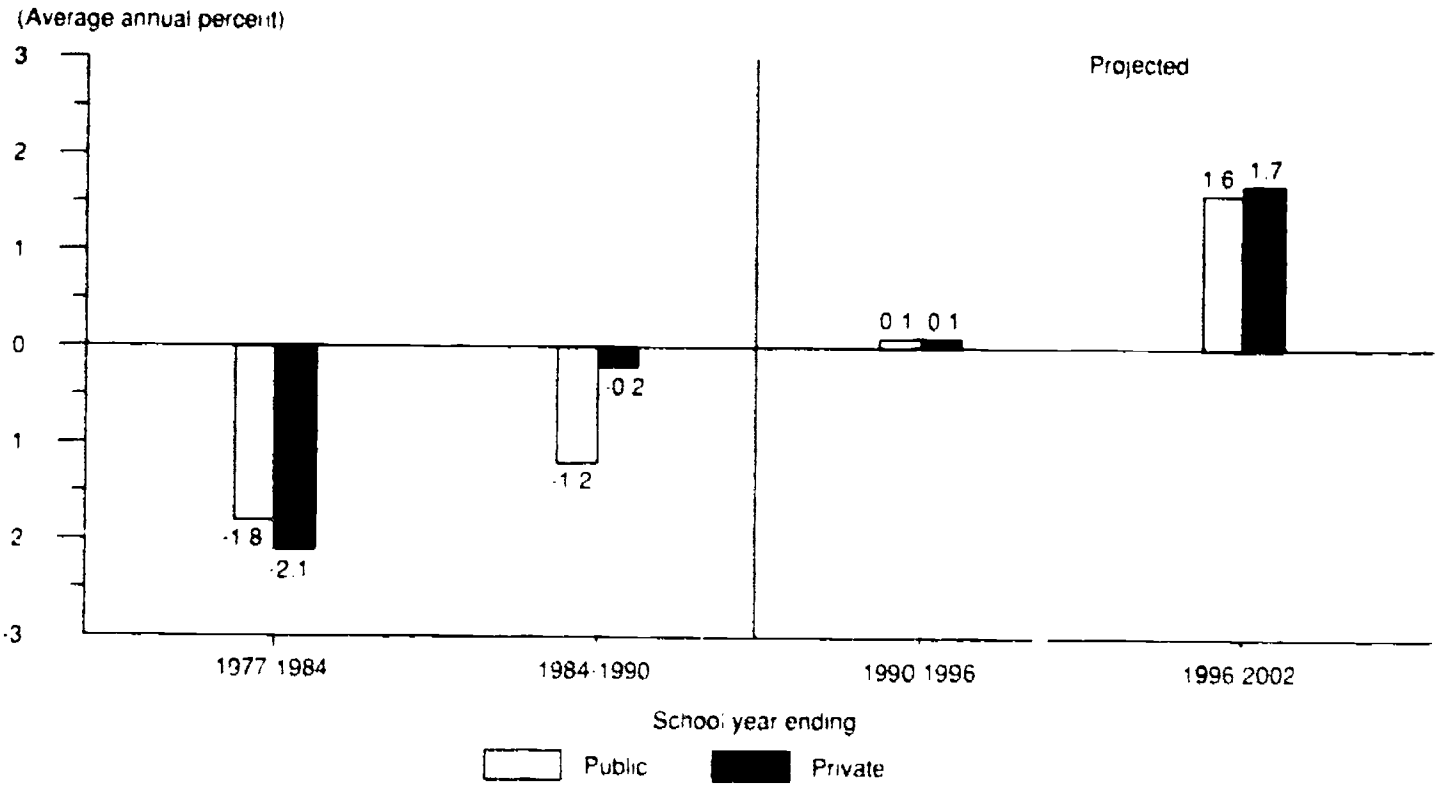


Table 26.—High school graduates, by control of institution, with projections: 50 States and D.C., 1976–77 to 2001–2002

(In thousands)

Year ending	Total	Public	Private
1977	3,155	2,840	315
1978	3,127	2,825	302
1979	3,117	2,817	300
1980	3,043	2,748	295
1981	3,020	2,725	295
1982	2,995	2,705	290
1983	2,888	2,598	290
1984	2,767	2,495	272
1985	2,677	2,414	263
1986	2,643	2,383	260
1987	2,694	2,429	265
1988	2,773	2,500	273
1989	2,724	2,456	268
1990*	2,592	2,324	268
		Projected	
1991	2,465	2,210	255
1992	2,446	2,193	253
1993	2,470	2,215	255
1994	2,464	2,209	255
1995	2,563	2,298	265
1996	2,615	2,345	270
1997	2,719	2,438	281
1998	2,831	2,538	293
1999	2,885	2,587	298
2000	2,932	2,629	303
2001	2,943	2,639	304
2002	2,882	2,584	298

*Estimate

NOTE: Prior to 1989–90, numbers for private high school graduates were estimated by NCES. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of Public Elementary and Secondary Schools*; Common Core of Data surveys; "Selected Public and Private Elementary and Secondary Education Statistics," *NCES Bulletin*, October 23, 1979; "Private Elementary and Secondary Education, 1983: Enrollment, Teachers, and Schools," *NCES Bulletin*, December 1984; 1985 Private School Survey; "Key Statistics for Public Elementary and Secondary Education School Year 1989-90," *Early Estimates*; "Key Statistics for Private Elementary and Secondary Education School Year 1988-89," *Early Estimates*; "Key Statistics for Private Elementary and Secondary Education School Year 1989-90," *Early Estimates*, and "Key Statistics for Public and Private Elementary and Secondary Education: School Year 1990-91," *Early Estimates*. (This table was prepared May 1991.)

Chapter 4

Earned Degrees Conferred

The historical growth in enrollment of women in institutions of higher education led to an increase in the number of earned degrees conferred. Between 1976-77 and 1989-90, the number of degrees awarded to women rose at all levels. In contrast, degrees conferred on men declined at all levels. In 1989–90, women earned the majority of associate, bachelor's, and master's degrees, more than one-third of doctor's degrees, and nearly two-fifths of first-professional degrees. Over the projection period, the number of degrees awarded to women will continue to rise at all levels. With the exception of doctor's degrees, the trends in the number of degrees awarded to men will reverse and increase over the projection period.

Three alternative projections of earned degrees by level and sex were developed. The number of degrees was related to college-age populations and higher education enrollment by level enrolled and attendance status.

Associate Degrees

Between 1976–77 and 1989-90, the number of associate degrees increased from 406,000 to 445,000, an increase of 10 percent (table 27 and figure 31). Under the middle alternative, this number is expected to increase to 539,000 by 2001–2002, an increase of 21 percent. Under the low and high alternatives, the number of associate degrees is projected to range between 510,000 and 576,000 by 2001–2002. The number of associate degrees awarded to men decreased from 211,000 in 1976–77 to 185,000 in 1989–90, a decrease of 12 percent (figure 32). Under the middle alternative, this number is projected to increase to 219,000 by 2001–2002, an increase of 18 percent. Under the low and high alternatives, the number of associate degrees awarded to men is expected to range between 205,000 and 238,000 by 2001–2002. The number of associate degrees awarded to women increased from 196,000 in 1976-77 to 260,000 in 1989–90, an increase of 33 percent. Under the middle alternative, this number is rise to increase to 320,000 by 2001–2002, an increase of 23 percent. Under the low and high alternatives, the number of associate degrees awarded to women is projected to range between 305,000 and 338,000 by 2001–2002.

Bachelor's Degrees

The number of bachelor's degrees rose from 919,000 in 1976–77 to 1,043,000 in 1989–90, an increase of 13 percent (table 28 and figure 33). Under the middle alternative, this number is expected to rise to 1,189,000 by 2001–2002, an increase of 14 percent. Under the low and high alternatives, the number of bachelor's degrees is projected to range between 1,130,000 and 1,277,000. The number of bachelor's degrees awarded to men declined from 496,000 in 1976–77 to 485,000 in 1989–90, a decrease of 2 percent (figure 34). Under the middle alternative, this number is expected to increase to 528,000 by 2001–2002, an increase of 9 percent. Under the low and high alternatives, the number of bachelor's degrees awarded to men is projected to range between 501,000 and 571,000 by 2001–2002. The number of bachelor's degrees awarded to women increased from 424,000 in 1976–77 to 558,000 in 1989-90, an increase of 32 percent. Under the middle alternative, this number is expected to increase to 661,000 by 2001–2002, an increase of 18 percent. Under the low and high alternatives, the number of bachelor's degrees awarded to women is projected to range between 629,000 and 706,000 by 2001–2002.

Master's Degrees

The number of master's degrees peaked at 317,000 in 1976–77. This number then fell to 284,000 in 1983–84 before rising to 319,000 in 1989–90, an increase of 12 percent from 1983–84 (table 29 and figure 35). Under the middle alternative, this number is expected to increase to 383,000 by 2001–2002, an increase of 20 percent. Under the low and high alternatives, the number of master's degrees is projected to range between 342,000 and 430,000 by 2001–2002. The number of master's degrees awarded to men decreased from 168,000 in 1976–77 to 149,000 in 1989–90, a decrease of 11 percent (figure 36). Under the middle alternative, this number is projected to increase to 184,000 in 2001–2002, an increase of 23 percent. Under the low and high alternatives, the number of master's degrees awarded to men is projected to range between 152,000 and 223,000 by 2001–2002. The number of degrees awarded to women increased from 149,000 to 170,000 in 1989–90, an increase of 14 percent. Under the middle alternative, this number is expected to increase to

199,000 by 2001–2002, an increase of 17 percent. Under the low and high alternatives, the number of master's degrees awarded to women is projected to range between 190,000 and 207,000 by 2001–2002.

Doctor's Degrees

The number of doctor's degrees increased from 33,200 in 1976–77 to 38,000 in 1989–90, an increase of 14 percent (table 30 and figure 37). Under the middle alternative, this number is expected to increase to 41,400, an increase of 9 percent. Under the low and high alternatives, the number of doctor's degrees is projected to range between 36,700 and 48,000 by 2001–2002. Most notable are the trends in degrees awarded to men and women (figure 38). The number of degrees awarded to men fell from 25,100 in 1976–77 to 22,700 in 1988-89. Then, it increased to 24,000 in 1989–90. Under the middle alternative, this number is expected to fall to 22,400 by 2001-2002, a decrease of 7 percent. Under the low and high alternatives, the number of doctor's degrees awarded to men is projected to range between 17,900 and 28,800 by 2001–2002. The number of degrees awarded to women rose from 8,100 in 1976–77 to 14,000 in 1989–90, an increase of 73 percent. In the 1990s and beyond, this pattern is expected to continue. Under the middle alternative, the number of doctor's degrees awarded to women is projected to climb to 19,000 by 2001–2002, an increase of 36 percent. Under the low and high alternatives, the number of doctor's degrees awarded to women is projected to range between 18,800 and 19,200 by 2001 2002. The share of doctor's degrees awarded to women, which was 24 percent in 1976–77 and 37 percent in 1989-90, is projected to climb to 46 percent by 2001–2002.

First-Professional Degrees

The number of first-professional degrees awarded rose from 64,400 in 1976–77 to 71,000 in 1989–90, an increase of 10 percent (table 31 and figure 39). Under the middle alternative, this number is expected to be 94,400 by 2001–2002, an increase of 33 percent. Under the low and high alternatives, the number of first-professional degrees is projected to range between 83,300 and 106,300 by 2001–2002. The number of first-professional degrees awarded to men decreased from 52,400 in 1976–77 to 43,000 in 1989–90, a decrease of 18 percent (figure 40). Under the middle alternative, this number is projected to increase to 57,000 by 2001–2002, an increase of 33 percent. Under the low and high alternatives, the number of first-professional degrees awarded to men is projected to range between 50,100 and 65,700 by 2001–2002. The number of first-professional degrees awarded to women more than doubled, from 12,000 in 1976–77 to 28,000 in 1989–90. Under the middle alternative, this number is expected to increase to 37,400 by 2001–2002, an increase of 34 percent. Under the low and high alternatives, the number of first-professional degrees awarded to women is projected to range between 33,200 and 40,600 by 2001–2002. The women's proportion of first-professional degrees rose from 19 percent in 1976–77 to 39 percent in 1989–90. By 2001–2002, this proportion is expected to be 40 percent.

Figure 31

Associate degrees, with alternative projections: 1976-77 to 2001-2002

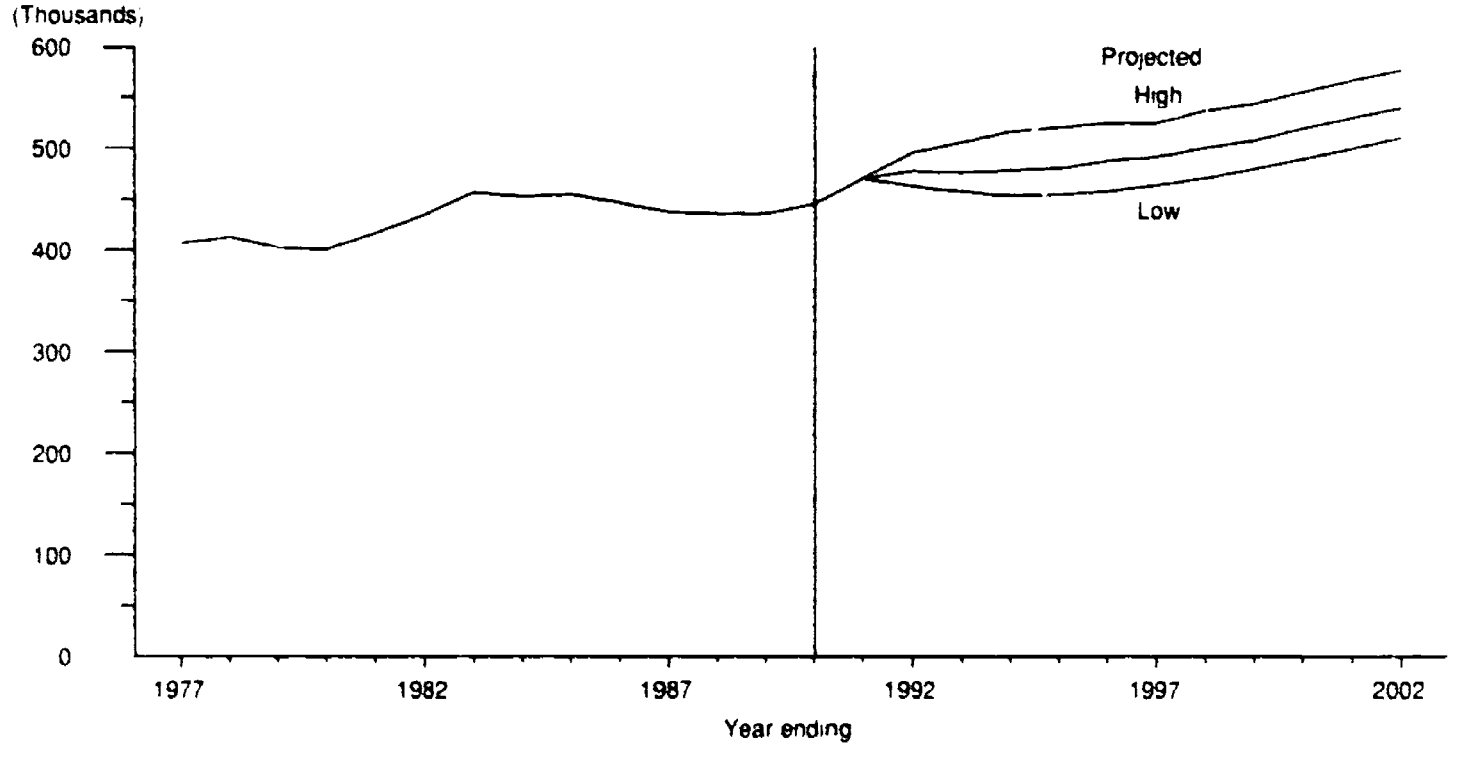


Figure 32

Associate degrees, by sex of recipient, with middle alternative projections: 1976-77 to 2001-2002

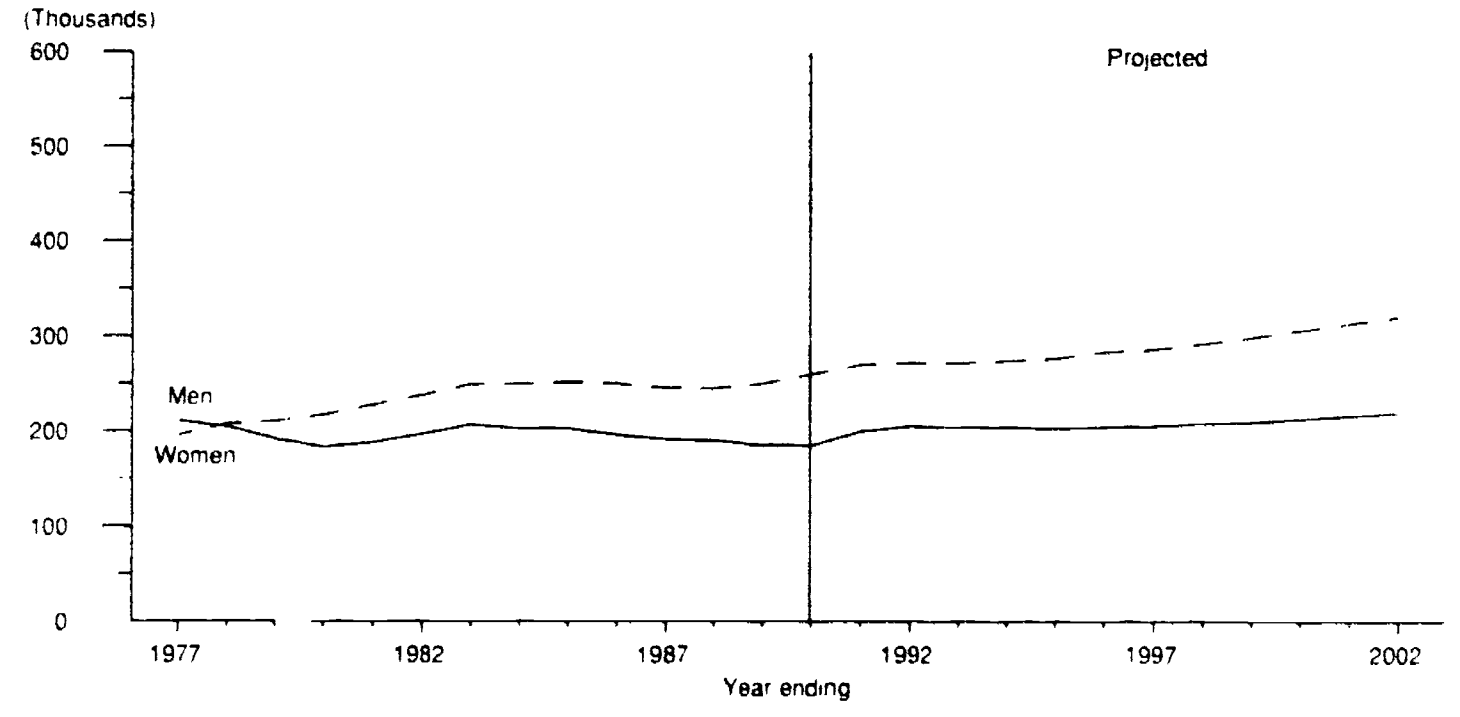


Figure 33

Bachelor's degrees, with alternative projections: 1976-77 to 2001-2002

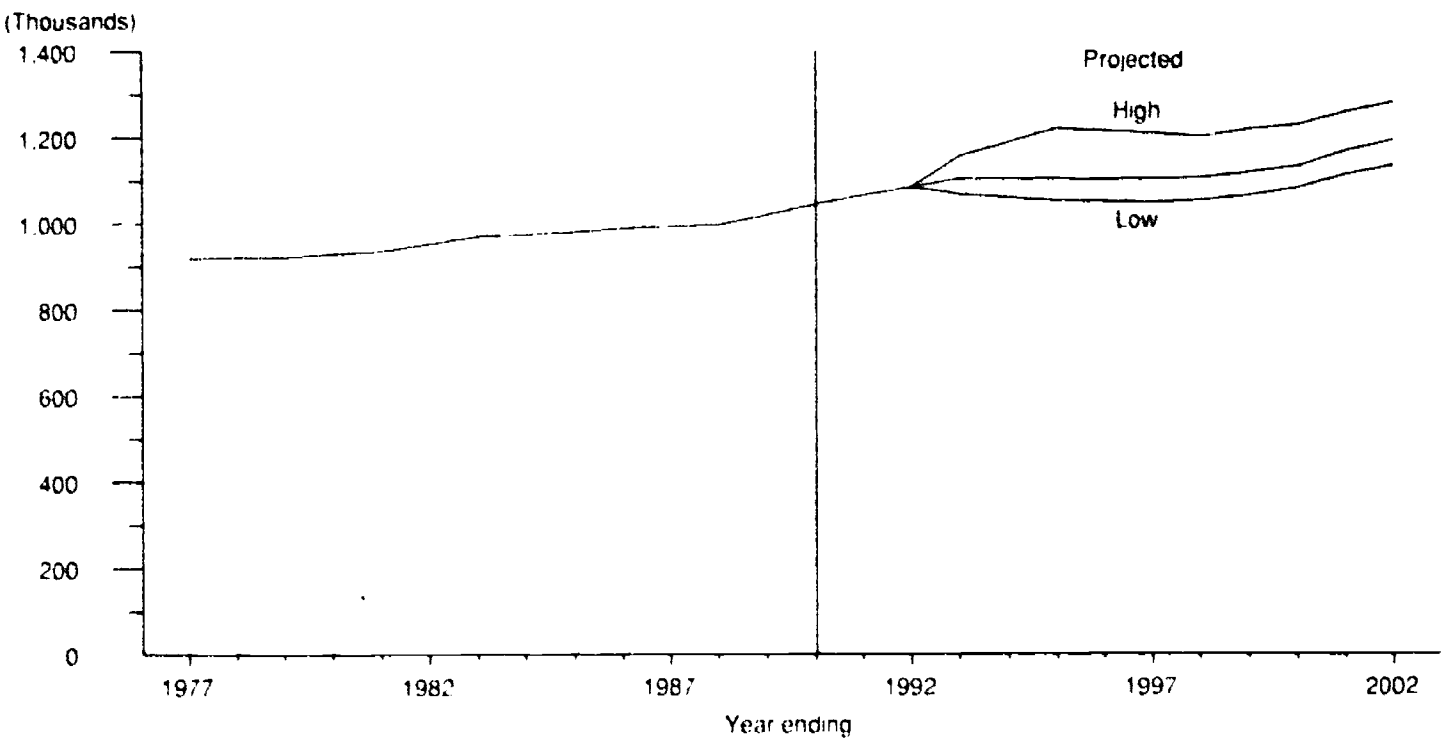


Figure 34

Bachelor's degrees, by sex of recipient, with middle alternative projections: 1976-77 to 2001-2002

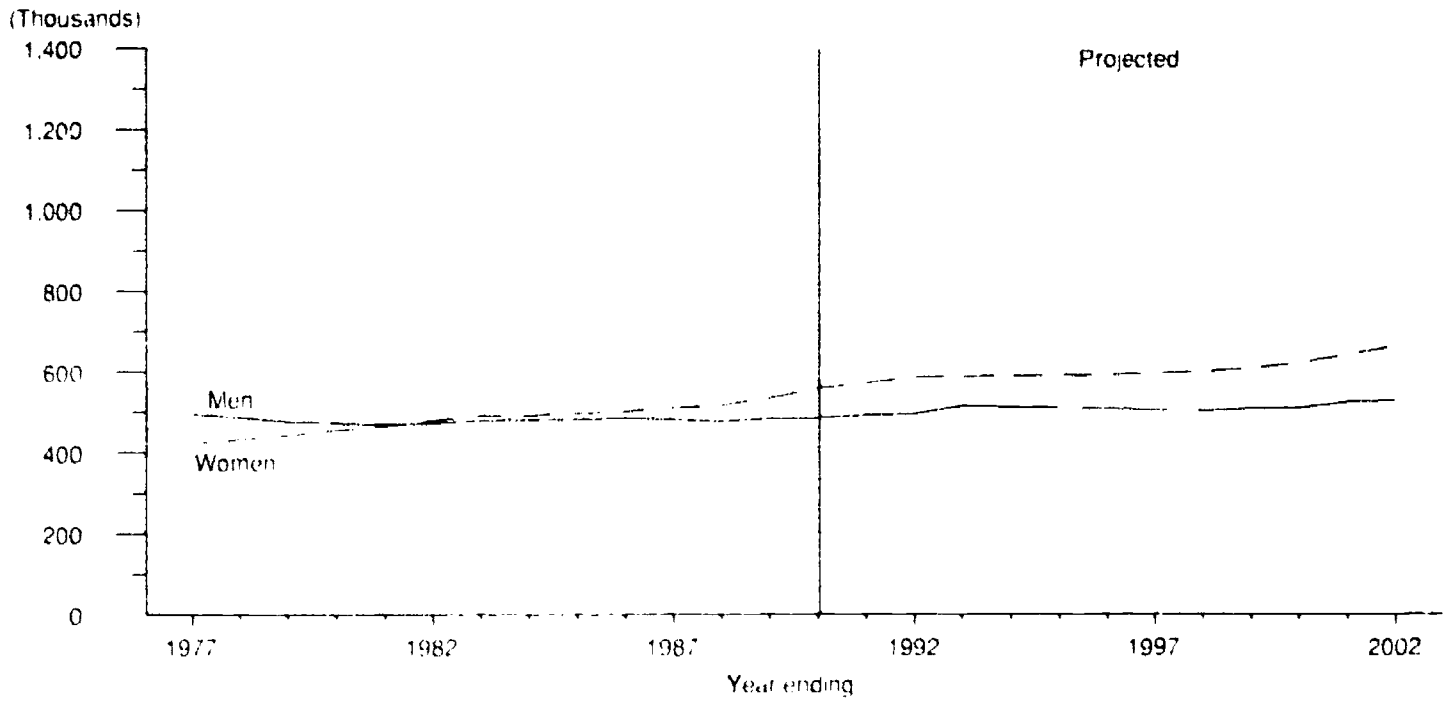


Figure 35

Master's degrees, with alternative projections: 1976-77 to 2001-2002

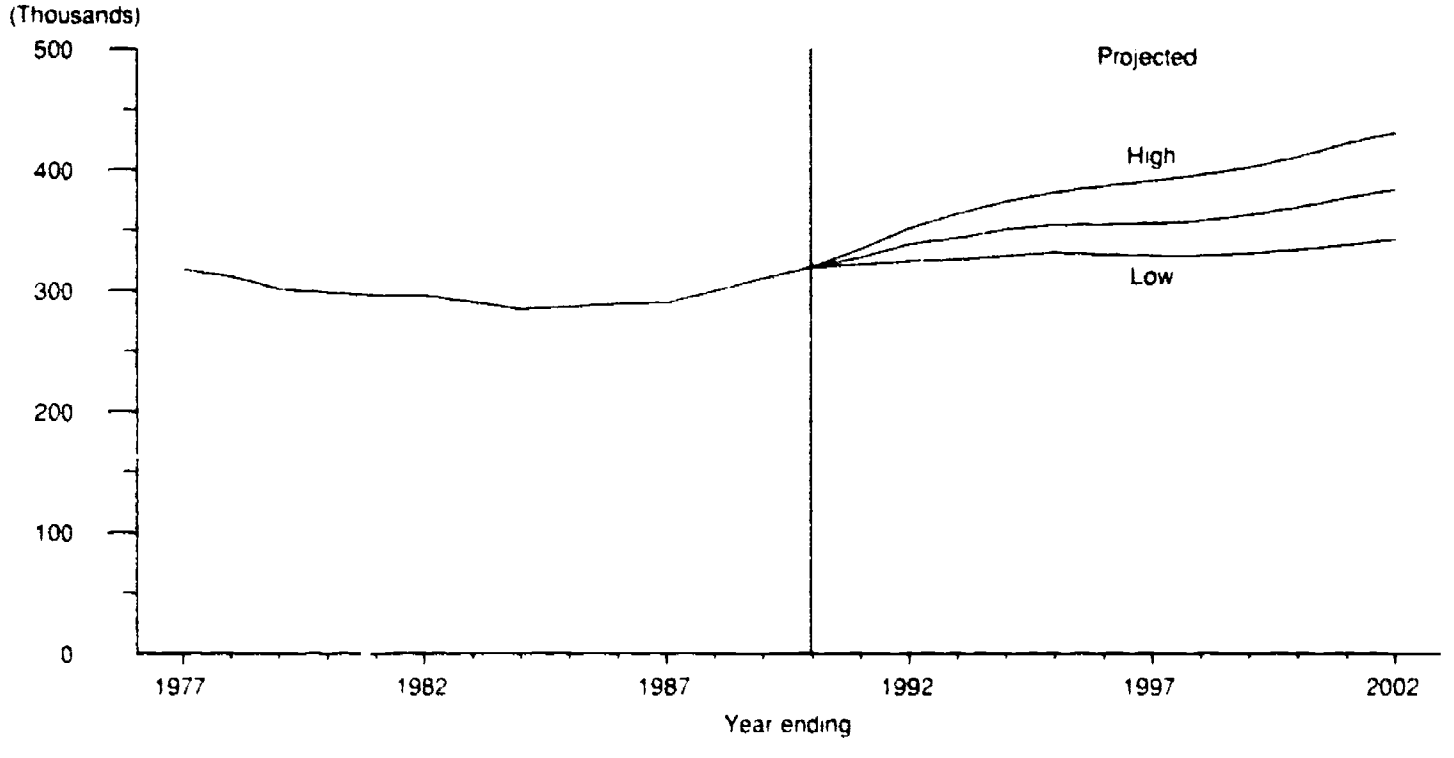


Figure 36

Master's degrees, by sex of recipient, with middle alternative projections: 1976-77 to 2001-2002

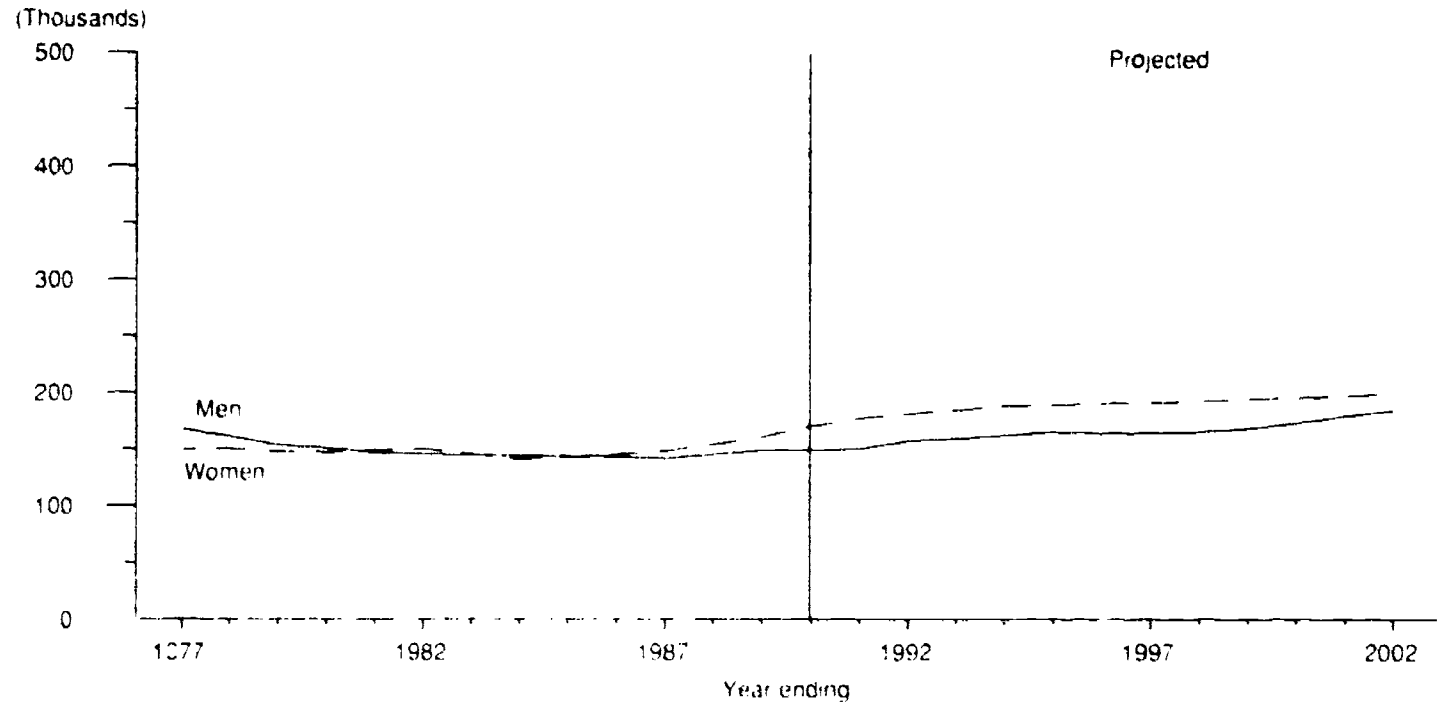


Figure 37

Doctor's degrees, with alternative projections: 1976-77 to 2001-2002

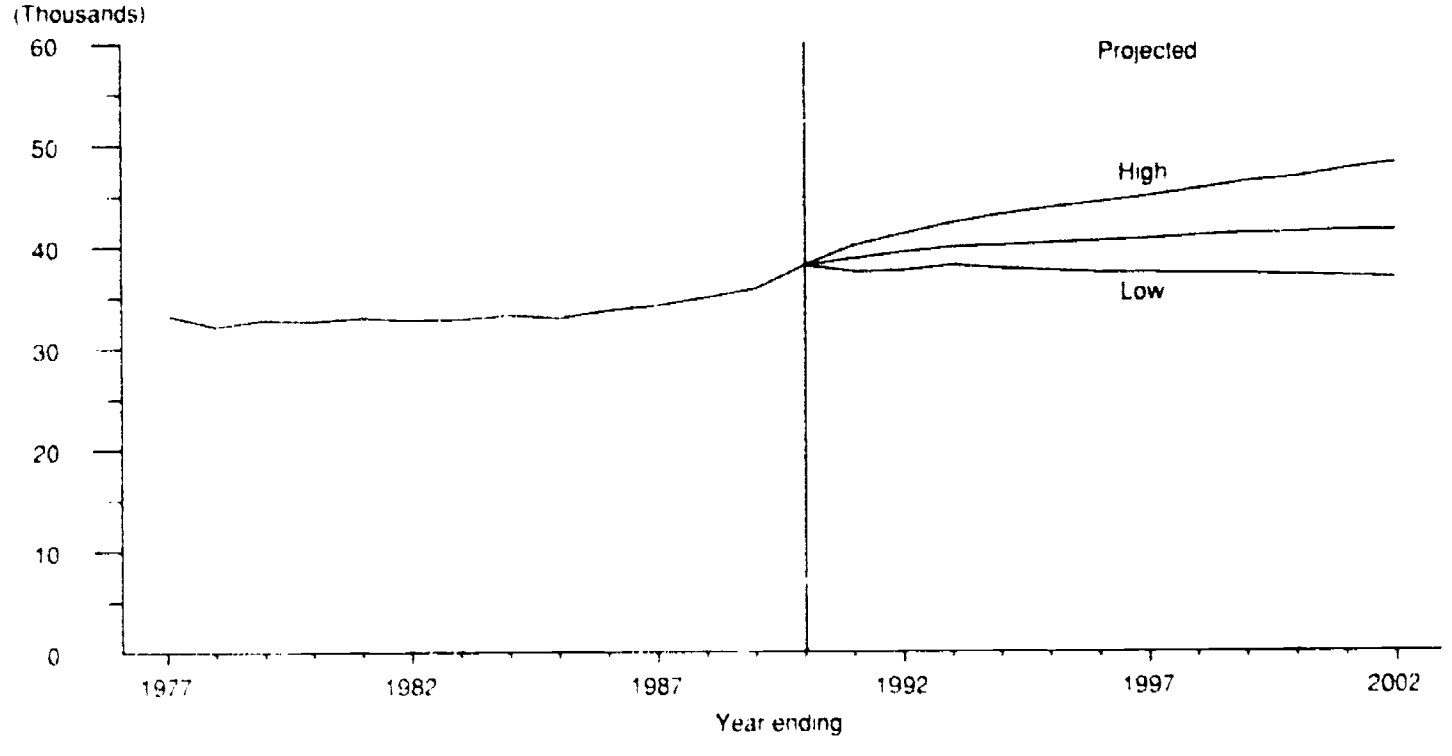


Figure 38

Doctor's degrees, by sex of recipient, with middle alternative projections: 1976-77 to 2001-2002

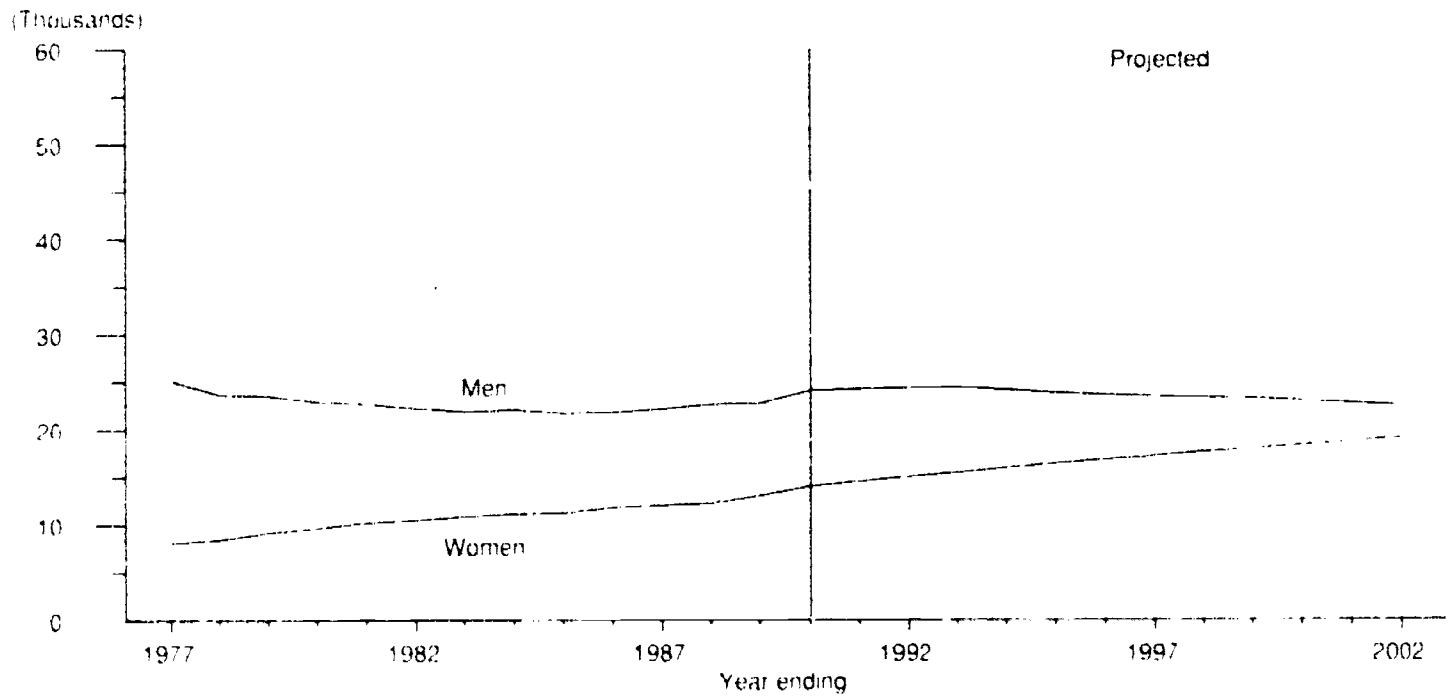


Figure 39

First-professional degrees, with alternative projections: 1976-77 to 2001-2002

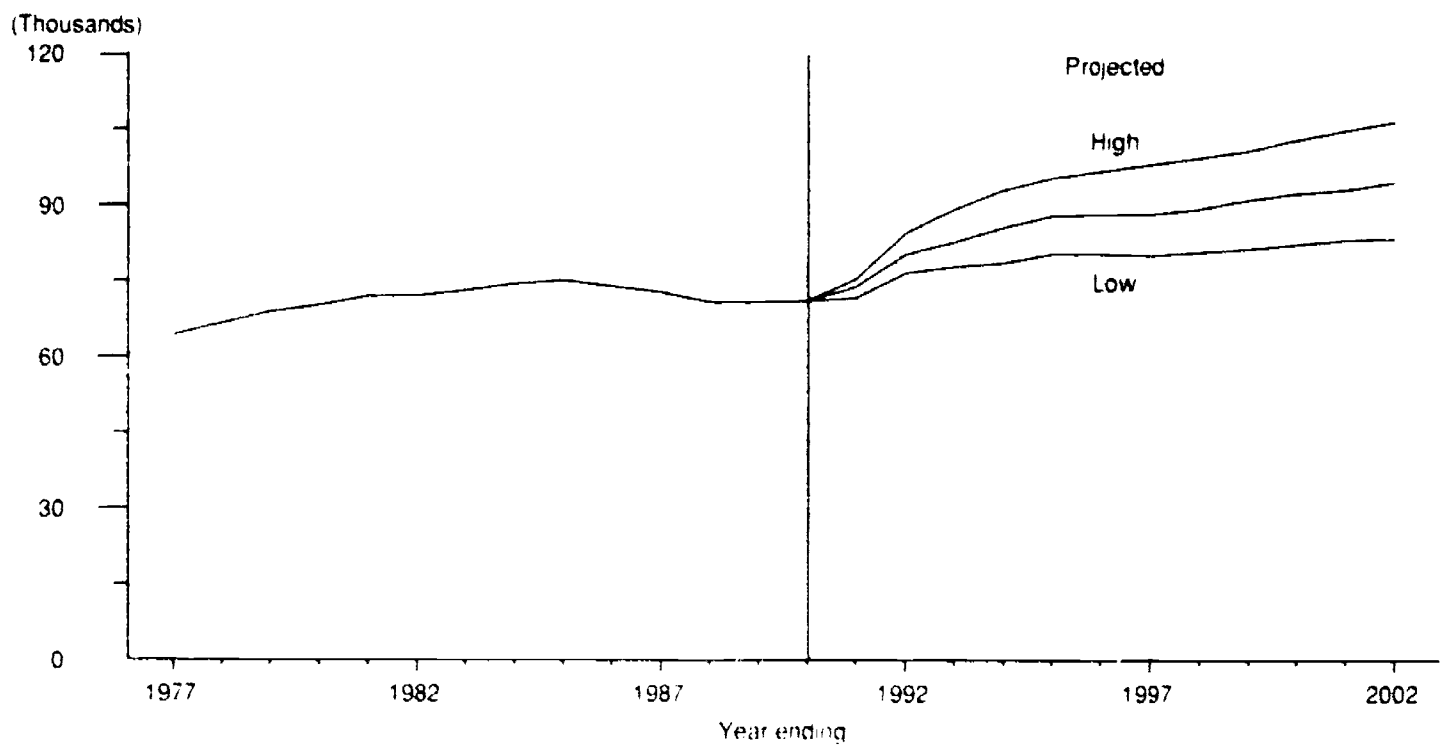


Figure 40

First-professional degrees, by sex of recipient, with middle alternative projections: 1976-77 to 2001-2002

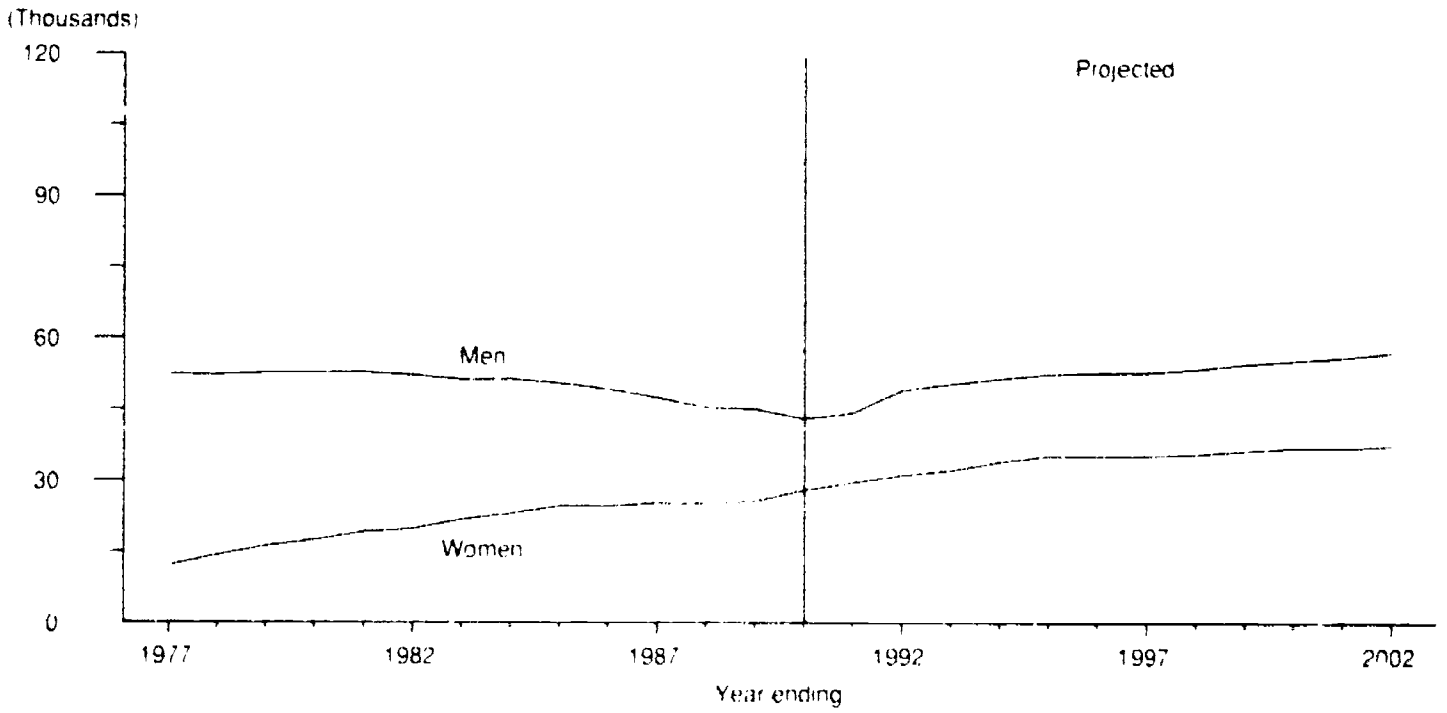


Table 27.—Associate degrees, by sex of recipient, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Total	Men	Women
1977	406,377	210,842	195,535
1978	412,246	204,718	207,528
1979	402,702	192,091	210,611
1980	400,910	183,737	217,173
1981	416,377	188,638	227,739
1982	434,515	196,939	237,576
1983	456,441	207,141	249,300
1984	452,416	202,762	249,654
1985	454,712	202,932	251,780
1986	446,047	196,166	249,881
1987	437,137	191,525	245,612
1988	435,085	190,047	245,038
1989	435,210	185,406	249,804
1990[1]	445,000	185,000	260,000
	Middle alternative projections		
1991	470,000	200,000	270,000
1992	477,000	205,000	272,000
1993	476,000	204,000	272,000
1994	478,000	204,000	274,000
1995	480,000	203,000	277,000
1996	487,000	204,000	283,000
1997	491,000	205,000	286,000
1998	500,000	208,000	292,000
1999	507,000	209,000	298,000
2000	519,000	213,000	306,000
2001	529,000	216,000	313,000
2002	539,000	219,000	320,000
	Low alternative projections		
1991	470,000	200,000	270,000
1992	462,000	198,000	264,000
1993	457,000	196,000	261,000
1994	453,000	194,000	259,000
1995	454,000	193,000	261,000
1996	457,000	193,000	264,000
1997	463,000	194,000	269,000
1998	470,000	195,000	275,000
1999	479,000	197,000	282,000
2000	489,000	200,000	289,000
2001	499,000	202,000	297,000
2002	510,000	205,000	305,000
	High alternative projections		
1991	470,000	200,000	270,000
1992	495,000	208,000	287,000
1993	505,000	210,000	295,000
1994	516,000	212,000	304,000
1995	520,000	213,000	307,000
1996	524,000	216,000	308,000
1997	524,000	214,000	310,000
1998	536,000	221,000	315,000
1999	543,000	224,000	319,000
2000	555,000	229,000	326,000
2001	566,000	234,000	332,000
2002	576,000	238,000	338,000

[1] Estimate

NOTE: Projections are based on data through 1988–89. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Degrees and Other Formal Awards Conferred" survey, Integrated Postsecondary Education Data System (IPEDS), "Completions" survey, and "National Higher Education Statistics, Fall 1990," *Early Estimates*. (This table was prepared April 1991.)

Table 28.—Bachelor's degrees, by sex of recipient, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Total	Men	Women
1977	919,549	495,545	424,004
1978	921,204	487,347	433,857
1979	921,390	477,344	444,046
1980	929,417	473,611	455,806
1981	935,140	469,883	465,257
1982	952,998	473,364	479,634
1983	969,510	479,140	490,370
1984	974,309	482,319	491,990
1985	979,477	482,528	496,949
1986	987,823	485,923	501,900
1987	991,339	480,854	510,485
1988	994,829	477,203	517,626
1989	1,017,667	483,097	534,570
1990*	1,043,000	485,000	558,000
Middle alternative projections			
1991	1,064,000	492,000	572,000
1992	1,081,000	495,000	586,000
1993	1,101,000	514,000	587,000
1994	1,100,000	511,000	589,000
1995	1,100,000	510,000	590,000
1996	1,098,000	507,000	591,000
1997	1,100,000	505,000	595,000
1998	1,102,000	503,000	599,000
1999	1,114,000	507,000	607,000
2000	1,129,000	509,000	620,000
2001	1,164,000	523,000	641,000
2002	1,189,000	528,000	661,000
Low alternative projections			
1991	1,064,000	492,000	572,000
1992	1,081,000	495,000	586,000
1993	1,065,000	496,000	569,000
1994	1,057,000	493,000	564,000
1995	1,050,000	491,000	559,000
1996	1,047,000	487,000	560,000
1997	1,045,000	483,000	562,000
1998	1,050,000	481,000	569,000
1999	1,061,000	483,000	578,000
2000	1,078,000	486,000	592,000
2001	1,109,000	499,000	610,000
2002	1,130,000	501,000	629,000
High alternative projections			
1991	1,064,000	492,000	572,000
1992	1,081,000	495,000	586,000
1993	1,153,000	522,000	631,000
1994	1,185,000	529,000	656,000
1995	1,217,000	537,000	680,000
1996	1,211,000	536,000	675,000
1997	1,206,000	539,000	667,000
1998	1,197,000	531,000	666,000
1999	1,214,000	544,000	670,000
2000	1,224,000	548,000	676,000
2001	1,254,000	564,000	690,000
2002	1,277,000	571,000	706,000

*Estimate

NOTE: Projections are based on data through 1988–89. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Degrees and Other Formal Awards Conferred" survey, Integrated Postsecondary Education Data System (IPEDS), "Completions" survey, and "National Higher Education Statistics, Fall 1990," *Early Estimates*. (This table was prepared April 1991.)

Table 29.—Master's degrees, by sex of recipient, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Total	Men	Women
1977	317,164	167,783	149,381
1978	311,620	161,212	150,408
1979	301,079	153,370	147,709
1980	298,081	150,749	147,332
1981	295,739	147,043	148,696
1982	295,546	145,532	150,014
1983	289,921	144,697	145,224
1984	284,263	143,595	140,668
1985	286,251	143,390	142,861
1986	288,867	143,508	145,059
1987	289,557	141,363	148,194
1988	299,317	145,163	154,154
1989	309,762	148,982	160,780
1990*	319,000	149,000	170,000
	Middle alternative projections		
1991	327,000	150,000	177,000
1992	338,000	157,000	181,000
1993	343,000	159,000	184,000
1994	350,000	162,000	188,000
1995	354,000	165,000	189,000
1996	354,000	164,000	190,000
1997	355,000	164,000	191,000
1998	357,000	165,000	192,000
1999	362,000	168,000	194,000
2000	368,000	173,000	195,000
2001	376,000	179,000	197,000
2002	383,000	184,000	199,000
	Low alternative projections		
1991	321,000	150,000	171,000
1992	324,000	152,000	172,000
1993	325,000	152,000	173,000
1994	328,000	153,000	175,000
1995	331,000	155,000	176,000
1996	329,000	151,000	178,000
1997	328,000	148,000	180,000
1998	328,000	146,000	182,000
1999	330,000	146,000	184,000
2000	333,000	147,000	186,000
2001	337,000	149,000	188,000
2002	342,000	152,000	190,000
	High alternative projections		
1991	334,000	150,000	184,000
1992	351,000	163,000	188,000
1993	363,000	170,000	193,000
1994	373,000	176,000	197,000
1995	381,000	184,000	197,000
1996	386,000	188,000	198,000
1997	390,000	191,000	199,000
1998	395,000	195,000	200,000
1999	401,000	199,000	202,000
2000	410,000	207,000	203,000
2001	421,000	216,000	205,000
2002	430,000	223,000	207,000

*Estimate.

NOTE: Projections are based on data through 1988–89. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Degrees and Other Formal Awards Conferred" survey, Integrated Postsecondary Education Data System (IPEDS), "Completions" survey, and "National Higher Education Statistics Fall 1990," *Early Estimates*. (This table was prepared April 1991.)

Table 30.—Doctor's degrees, by sex of recipient, with alternative projections: 50 States and D.C. 1976–77 to 2001–2002

Year ending	Total	Men	Women
1977	33,232	25,142	8,090
1978	32,131	23,658	8,473
1979	32,730	23,541	9,189
1980	32,615	22,943	9,672
1981	32,958	22,711	10,247
1982	32,707	22,224	10,483
1983	32,775	21,902	10,873
1984	33,209	22,064	11,145
1985	32,943	21,700	11,243
1986	33,653	21,819	11,834
1987	34,120	22,099	12,021
1988	34,870	22,615	12,255
1989	35,759	22,705	13,054
1990*	38,000	24,000	14,000
	Middle alternative projections		
1991	38,700	24,200	14,500
1992	39,300	24,300	15,000
1993	39,800	24,400	15,400
1994	40,000	24,100	15,900
1995	40,200	23,800	16,400
1996	40,400	23,600	16,800
1997	40,600	23,400	17,200
1998	40,900	23,300	17,600
1999	41,100	23,200	17,900
2000	41,200	22,900	18,300
2001	41,400	22,700	18,700
2002	41,400	22,400	19,000
	Low alternative projections		
1991	37,400	23,000	14,400
1992	37,500	22,700	14,800
1993	38,000	22,800	15,200
1994	37,700	22,100	15,600
1995	37,500	21,500	16,000
1996	37,300	20,800	16,500
1997	37,300	20,400	16,900
1998	37,200	19,900	17,300
1999	37,100	19,400	17,700
2000	37,000	18,900	18,100
2001	36,900	18,400	18,500
2002	36,700	17,900	18,800
	High alternative projections		
1991	40,000	25,400	14,600
1992	41,100	25,900	15,200
1993	42,200	26,600	15,600
1994	43,000	26,900	16,100
1995	43,700	27,100	16,600
1996	44,200	27,200	17,000
1997	44,800	27,400	17,400
1998	45,500	27,700	17,800
1999	46,200	28,100	18,100
2000	46,600	28,100	18,500
2001	47,400	28,500	18,900
2002	50,300	30,000	20,300

*Estimate

NOTE: Projections are based on data through 1988–89. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Degrees and Other Formal Awards Conferred" survey; Integrated Postsecondary Education Data System (IPEDS), "Completions" survey, and "National Higher Education Statistics: Fall 1990," *Early Estimates*. (This table was prepared April 1991.)

Table 31.—First-professional degrees, by sex of recipient, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Total	Men	Women
1977	64,359	52,374	11,985
1978	66,581	52,270	14,311
1979	68,848	52,652	16,196
1980	70,131	52,716	17,415
1981	71,956	52,792	19,164
1982	72,032	52,223	19,809
1983	73,136	51,310	21,826
1984	74,407	51,334	23,073
1985	75,063	50,455	24,608
1986	73,910	49,261	24,649
1987	72,750	47,460	25,290
1988	70,735	45,484	25,251
1989	70,758	45,067	25,691
1990*	71,000	43,000	28,000
	Middle alternative projections		
1991	73,800	44,200	29,600
1992	80,100	49,000	31,100
1993	82,600	50,400	32,200
1994	85,500	51,500	34,000
1995	87,800	52,500	35,300
1996	88,100	52,800	35,300
1997	88,100	52,800	35,300
1998	89,100	53,500	35,600
1999	90,900	54,600	36,300
2000	92,200	55,300	36,900
2001	92,900	56,000	36,900
2002	94,400	57,000	37,400
	Low alternative projections		
1991	71,600	44,200	27,400
1992	76,500	48,000	28,500
1993	77,700	48,700	29,000
1994	78,500	49,000	29,500
1995	80,300	49,700	30,600
1996	80,300	49,700	30,600
1997	80,000	49,400	30,600
1998	80,600	49,000	31,600
1999	81,200	49,400	31,800
2000	82,100	49,700	32,400
2001	83,000	50,100	32,900
2002	83,300	50,100	33,200
	High alternative projections		
1991	75,300	44,200	31,100
1992	84,400	50,400	34,000
1993	89,100	52,200	36,900
1994	92,900	54,200	38,700
1995	95,300	56,000	39,300
1996	96,600	57,300	39,300
1997	97,900	58,400	39,500
1998	99,200	59,400	39,800
1999	100,600	60,800	39,800
2000	102,800	62,500	40,300
2001	104,600	64,300	40,300
2002	106,300	66,000	40,600

*Estimate

NOTE: Projections are based on data through 1988–89. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Degrees and Other Formal Awards Conferred" survey, Integrated Postsecondary Education Data System (IPEDS), "Completions" survey, and "National Higher Education Statistics Fall 1990," *Early Estimates*. (This table was prepared April 1991.)

Chapter 5

Classroom Teachers

Between 1990 and 2002, the number of classroom teachers in elementary and secondary schools is projected to rise, primarily due to the increase in school enrollment during this period. The increase in classroom teachers will follow a slight decline in the number of teachers in 1992. Increases are expected in the numbers of both elementary and secondary teachers, although the number of secondary teachers will increase at a faster rate than the number of elementary teachers. The numbers of public and private teachers will grow at similar rates.

Three alternative projections of the numbers of classroom teachers were developed to indicate a range of possible outcomes. These alternatives are based on different assumptions about the growth paths for two of the key variables in the teacher model—disposable personal income per capita and local education revenue receipts from state governments per capita. Under the middle alternative, disposable personal income per capita is projected to increase by 16 percent between 1990 and 2002, while local education revenue receipts from state governments per capita will rise by 21 percent during this period. This scenario assumes that the economy will decline in the early 1990s and recover by the mid-1990s. If the economy continues to decline over the projection period, then the low alternative assumes that disposable personal income per capita and local education revenue receipts from state governments per capita will increase by 11 percent and 17 percent, respectively. On the other hand, if the economy improves throughout the projection period, then the high alternative assumes that disposable personal income per capita and local education revenue receipts from state governments per capita will increase by 22 percent and 27 percent, respectively. The third variable in the teacher model, enrollment by organizational level, is the same for all three alternatives.

For classroom teachers, the following tabulations show (1) the average annual growth rate (in percent) for 1977–90 and the three alternative projected growth rates for 1990–2002 and (2) the growth rates for 1977–84 and 1984–90 and the middle alternative projected growth rates for 1990–96 and 1996–2002.

Average annual rate of growth (in percent)

	1977–90	1990–2002		
		Low	Middle	High
Total	0.8	1.2	1.4	1.7
Elementary	1.3	1.0	1.3	1.6
Secondary	0.7	1.5	1.6	1.9
Public	0.6	1.2	1.4	1.7
Private	1.9	1.2	1.4	1.7

Average annual rate of growth (in percent)—Continued

	1977–90	1990–2002		
		Low	Middle	High
Public	0.6	1.2	1.4	1.7
Private	1.9	1.2	1.4	1.7

Average annual rate of growth (in percent)

(Middle alternative projections)

	1977–84	1984–90	Projected	
			1990–96	1996–2002
Total	0.1	1.5	1.6	1.3
Elementary	0.7	2.0	1.4	1.2
Secondary	0.7	0.8	1.9	1.4
Public	0.3	1.5	1.6	1.3
Private	2.9	0.6	1.5	1.3

Elementary and Secondary School Teachers

The number of classroom teachers in elementary and secondary schools decreased from 2.49 million in 1977 to 2.44 million in 1981, a decrease of 2 percent (table 32 and figure 41). Thereafter, this number increased steadily to 2.74 million in 1990, an increase of 13 percent. Under the middle alternative, the number of classroom teachers is projected to increase from 2.83 million in 1990 to 3.25 million by the year 2002, increasing at an annual rate of 1.4 percent, for a 19-percent increase over the projection period. The growth rate will be higher in the first half of the projection period (1990–96) than in the second half (1996–2002), 1.6 percent per year versus 1.3 percent (figure 42). Under the low and high alternatives, the number of classroom teachers is projected to range between 3.17 million and 3.35 million by the year 2002. For the low alternative, this will be an average annual growth rate of 1.2 percent. For the high alternative, this will be a growth rate of 1.7 percent.

Classroom Teachers, by Organizational Level

While elementary enrollment decreased from 1977 to 1980, the number of elementary teachers rose slightly,

from 1.38 million in 1977 to 1.40 million in 1980 (figure 43). Then, the number declined to 1.38 million in 1981. From 1981 to 1989, the number of elementary teachers rose to 1.66 million, an increase of 21 percent. In 1990, the number of classroom teachers declined to 1.63 million. Under the middle alternative, the number of elementary teachers is projected to remain at 1.63 million in 1991 and then increase to 1.9 million by 2002, an increase of 17 percent from 1990; this increase represents an average annual growth rate of 1.3 percent. During the projection period, the growth rate in the 1990-96 period will be 1.4 percent, while the growth rate in the 1996-2002 period will be 1.2 percent (figure 44). Both of these growth rates are below the growth rate of 2.0 percent in the 1984-90 period. Under the low and high alternatives, elementary teachers are projected to range between 1.84 million and 1.97 million by the year 2002. For the low alternative, this will be an average annual growth rate of 1.3 percent. For the high alternative, this will be a growth rate of 1.6 percent.

The number of secondary classroom teachers decreased from 1.11 million in 1977 to 1.04 million in 1982. Then, the number of secondary classroom teachers increased to 1.11 million in 1990, an increase of 7 percent from 1982. However, secondary enrollment decreased by 4 percent between 1982 and 1990. Under the middle alternative, the number of secondary teachers is projected to increase from 1.11 million in 1990 to 1.19 million in 1991, decrease slightly to 1.15 million in 1992, and then rise to 1.35 million by the year 2002, resulting in an increase of 21 percent from 1990. This increase would represent an average annual growth rate of 1.6 percent over the projection period. During the projection period, the growth rate in the 1990-96 period will be 1.9 percent, while the growth rate in the 1996–2002 period will be 1.4 percent. Both of these growth rates are above growth rate of 0.8 percent in the 1984–1990 period. Under the low and high alternatives, secondary teachers are projected to range between 1.32 million and 1.38 million by the year 2002. For the low alternative, this will be an average annual growth rate of 1.5 percent. For the high alternative, this will be a growth rate of 1.9 percent.

Classroom Teachers, by Control of School

The number of classroom teachers in public elementary and secondary schools decreased from 2.20 million in 1977 to 2.12 million in 1982. Then, the number of public school teachers increased to 2.39 million in 1990, an increase of 13 percent from 1982 (figure 45). Under the middle alternative, the number of public school teachers is projected to increase to 2.46 million in 1991, fall slightly to 2.43 million in 1992, and then increase to 2.84 million by the year 2002, resulting in an increase of 19 percent from 1990. This increase would represent an average annual growth rate of 1.4 percent. During the projection period, the growth rate in the 1990–96 period will be 1.6 percent while the growth rate in the 1996–2002 period will be 1.3 percent (figure 46). The growth rate in the 1990–96 period is the same as the growth rate in the 1984–90 period, while the growth rate in the 1996–2002 period is less than the rate in the 1984-90 period. Under the low and high alternatives, public school teachers are projected to range between 2.76 million and 2.92 million by the year 2002. For the low alternative, this will be an average annual growth rate of 1.2 percent. For the high alternative, this will be a growth rate of 1.7 percent.

The number of classroom teachers in private elementary and secondary schools was 353,000 in 1990. This number is projected to increase to 417,000 by the year 2002, an increase of 18 percent from 1990. This increase will represent an average annual growth rate of 1.4 percent. During the projection period, the growth rate in the 1990-96 period will be 1.5 percent, while the growth rate in the 1996-2002 period will be 1.3 percent. Both of these growth rates are well above the growth rate of 0.6 percent in the 1984-90 period and below the growth rate of 2.9 percent in the 1977-84 period. Under the low and high alternatives, private school teachers are projected to range between 405,000 and 430,000 by the year 2002. For the low alternative, this will be an average annual growth rate of 1.2 percent. For the high alternative, this will be a growth rate of 1.7 percent.

Pupil-Teacher Ratios

A broad relationship between pupils and teachers can be described by the pupil-teacher ratio. The pupil-teacher ratios were computed based on elementary and secondary enrollment by organizational level and the number of classroom teachers by organizational level.

The pupil-teacher ratio in elementary schools decreased from 20.9 in 1977 to 17.3 in 1989 (table 33 and figure 47). Then, the pupil-teacher ratio increased to 18.2 in 1990. Under the middle alternative, this ratio is projected to continue to increase to 18.5 in 1992, before gradually declining to 17.2 by the year 2002. Under the low and high alternatives, the pupil-teacher ratio in elementary schools is expected to range between 16.6 and 17.8 by the year 2002.

For public elementary schools, under the middle alternative, the pupil-teacher ratio is projected to increase from 18.6 in 1990 to 18.9 in 1992 and then decline to 17.6 by the year 2002 (figure 48). Under the low and high alternatives, the pupil-teacher ratio in public elementary schools is projected to range between 17.0 and 18.1 by the year 2002. For private elementary schools, under the middle alternative, the pupil-teacher ratio is projected to increase from 16.1 in 1990 to 16.4 in 1993 and then decline to 15.4 by the year 2002. Under the low and high alternatives, the pupil-teacher ratio in private

elementary schools is expected to range between 14.9 and 15.9 by the year 2002.

For secondary schools, the pupil-teacher ratio decreased from 17.9 in 1977 to 15.7 in 1987. It increased to 16.0 and remained at that level in 1988 and 1989. Then, it dropped to 14.9. Under the middle alternative, this ratio is projected to rise to 15.2 in 1997 before falling to 15.0 by the year 2002. Under the low and high alternatives, the pupil teacher ratio in secondary schools is projected to range between 14.7 and 15.3 by the year 2002.

For public secondary schools, under the middle alternative, the pupil-teacher ratio is projected to decrease to 14.4 in 1991 and then increase to 15.6 in 1996 before falling to 15.3 by the year 2002. Under the low and high alternatives, the pupil-teacher ratio in public secondary schools is expected to range between 15.0 and 15.6 by the year 2002. For private elementary schools, under the middle alternative, the pupil-teacher ratio is projected to decline to 10.6 in 1991 and then increase to 11.6 in 1997 before falling to 11.4 by the year 2002. Under the low and high alternatives, the pupil-teacher ratio in private secondary schools is projected to range between 11.2 and 11.6 by the year 2002.

Although private school classroom teachers represented 13 percent of total classroom teachers in 1990, private school enrollment was 11 percent of total enrollment. This indicates that private schools have more teachers for a given number of students than do public schools; that is, private school pupil-teacher ratios are smaller than public school pupil-teacher ratios.

Teacher Demand and Supply—Issues and Available Data

The National Goals for Education for the year 2000 provide an impetus for a reexamination of the education system in the United States. The fulfillment of the goals underscores the need for qualified teachers. In turn, developing accurate projections of teacher supply and demand becomes a necessity in light of the age of the teaching force and pending retirements, as well as nonteaching opportunities for graduates and former teachers.

The National Center for Education Statistics (NCES) has published projections of teacher supply and demand in the past. Concerns about methodology and data availability resulted in a reevaluation of this effort by the National Academy of Sciences (NAS). NAS reviewed the national model of teacher supply and demand used by NCES. Two reports emerged from this review—*Toward Understanding Teacher Supply and Demand: Priorities for Research and Development,an Interim report* (1987) and *Precollege Science and Mathematics Teachers: Monitoring Supply, Demand, and Quality* (1990). Both reports cite the need for additional data, research on behavioral determinants of teacher supply and demand, and further model development, especially for teacher supply.

Overall, NAS found that the NCES model of teacher demand was fairly accurate for the short term. On the other hand, the supply model was criticized for its conceptual definition. At that time, the NCES model of teacher supply consisted of new teacher graduates. Even though the projections were published with numerous caveats stating that new teacher graduates were not the only source of supply of teachers, there was widespread belief among users of the data that new teacher graduates represent the total supply. The NAS reports and studies by Barro, Darling-Hammond, Haggstrom, and others have noted that supply is composed of two major components—continuing teachers and new entrants. The latter category includes newly certified persons, persons with previous teaching experience and certification (reentrants), and persons hired through alternative routes. In 1987, NAS recommended that NCES discontinue projecting new teacher graduates, given the available data and limited knowledge of components of supply.

At the time of the panel meetings of NAS, NCES was preparing to conduct a survey on the various aspects of teacher supply and demand. In 1990, data on teacher attrition and sources of teacher supply were released from the Schools and Staffing Survey. At present, data from this survey are available for only one time period and are insufficient for projecting teacher supply. Yet, these data can provide a retrospective look at the sources of supply for teachers entering the profession in 1987-88. These data are available from unpublished tabulations of the Schools and Staffing Survey.

Characteristics of School Teachers in 1987–88

Of the estimated 2.32 million public school teachers in 1987-88, 13.4 percent were under 30, 35 percent were 30 to 39 years old, and 50.3 percent were 40 years old and over. Between 1987 and 1988, 91 percent of public school teachers continued in the same school, 5.2 percent changed schools, and 3.8 percent left the profession. Of those who left the profession, 38.3 percent retired, 18.7 percent were working in another occupation, 13.2 percent were in homemaking/childrearing, 10 percent were on leave, 7 percent were attending college, 4 percent were unemployed, and 8 percent were classified as "other."

Of the estimated 307,000 private school teachers in 1987-88, 21.4 percent were under 30, 34 percent were 30 to 39 years old, and 43.1 percent were 40 years old and over. Between 1987 and 1988, 83 percent of private school teachers continued in the same school, 8.4 percent changed schools, and 8.7 percent left the profession. Of those who left the profession, 7.3 percent retired, 37.1 percent were working in another occupation, 26.9 percent were in homemaking/childrearing, 3 percent were on leave, 14 percent were attending college, 6 percent were unemployed, and 5 percent were classified as "other."

Teacher Demand in the 1990s and Beyond

On the demand side, the projections of classroom teachers in public schools shown in table 32 indicate that if the relationship among teachers and enrollment, disposable income, and local education revenue receipts from state sources prevails over the projection period, then 2.8 million public school teachers will be employed in the year 2002, up from 2.4 million who held jobs in 1990. Projected as a constant ratio of public school teachers by organizational level, the number of private school classroom teachers is projected to increase from 353,000 in 1990 to 417,000 by the year 2002.

Teacher Supply

Presently, projections of the supply of teachers to meet the projected demand for public and private school teachers are not available because of insufficient data. However, data on aspects of teacher supply and demand are being collected through the Schools and Staffing Survey of NCES. When more data become available, projections of teacher supply will be developed.

Figure 41

Elementary and secondary classroom teachers, with alternative projections: Fall 1977 to fall 2002

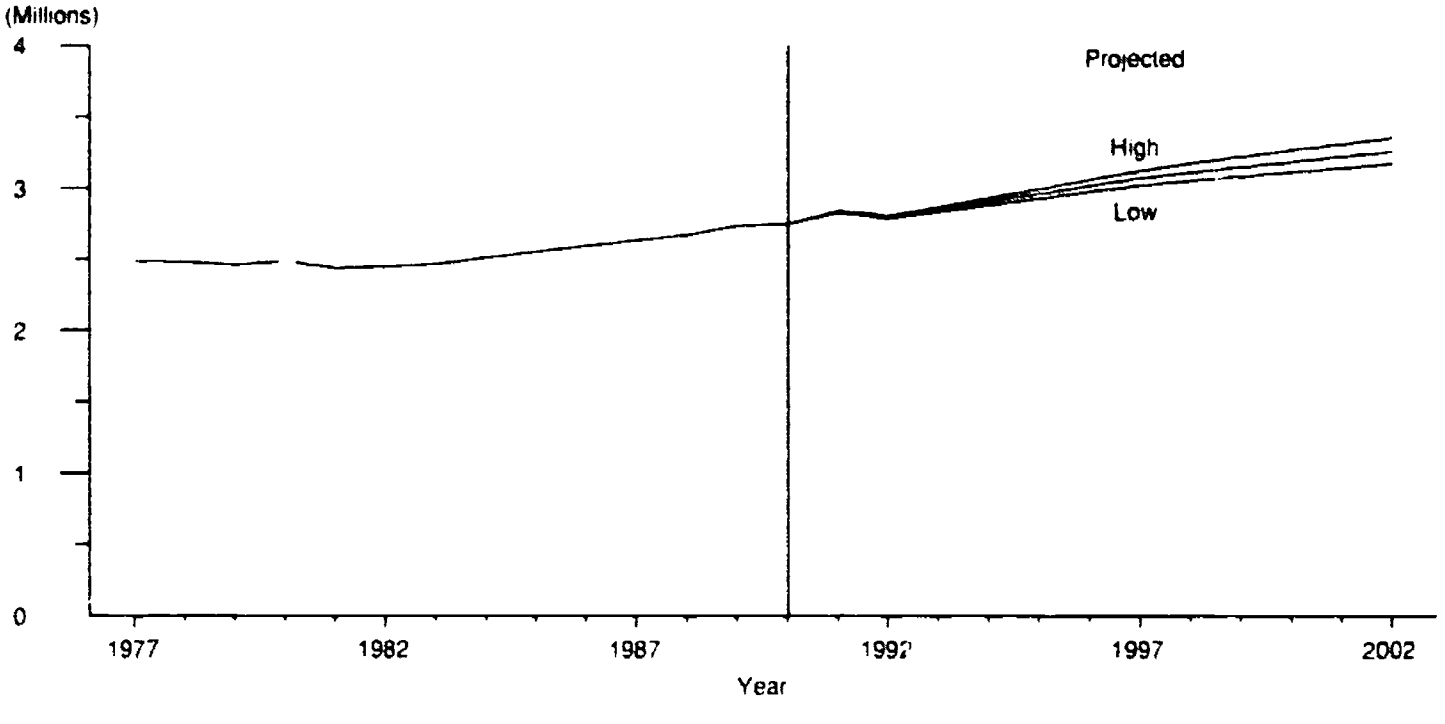


Figure 42

Average annual growth rates for classroom teachers

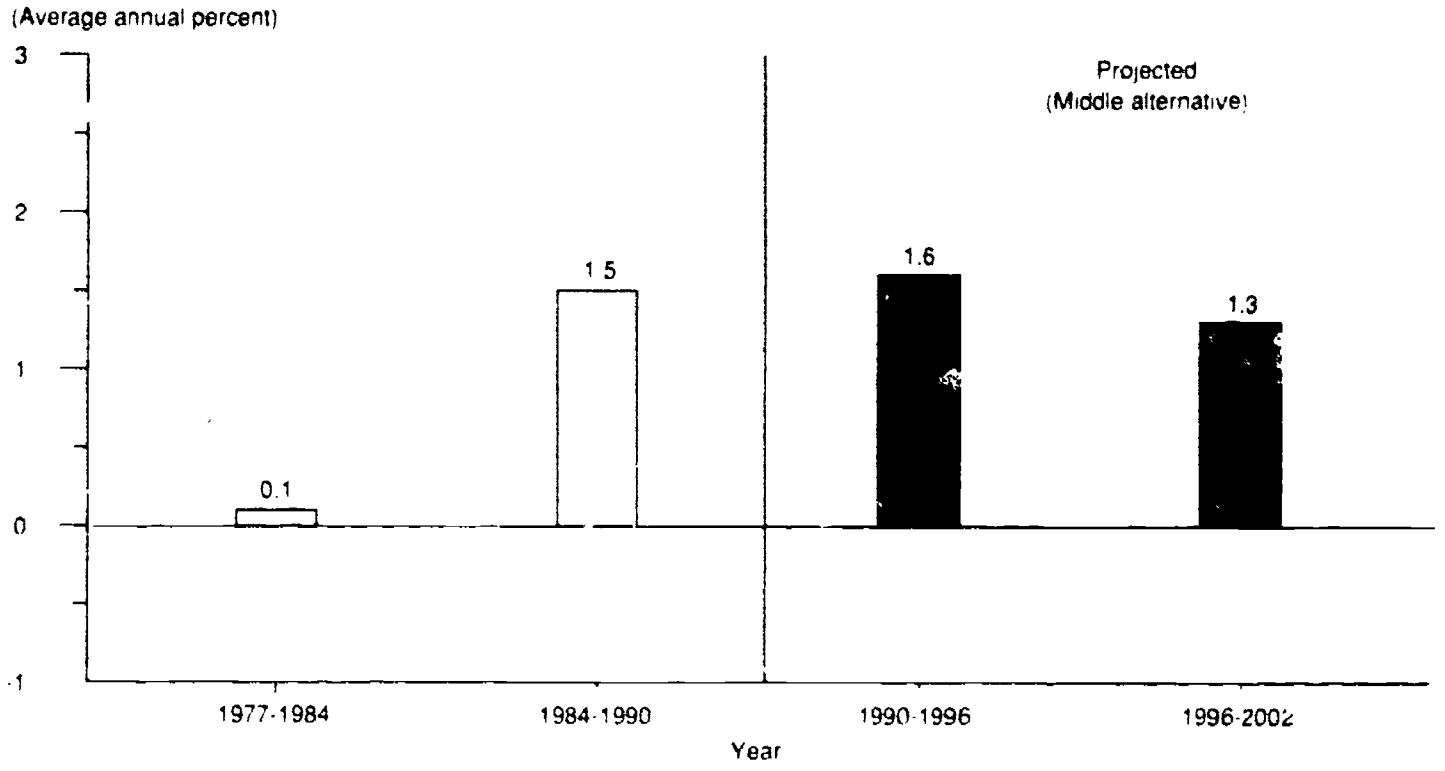


Figure 43

Elementary and secondary classroom teachers, by organizational level with middle alternative projections: Fall 1977 to fall 2002

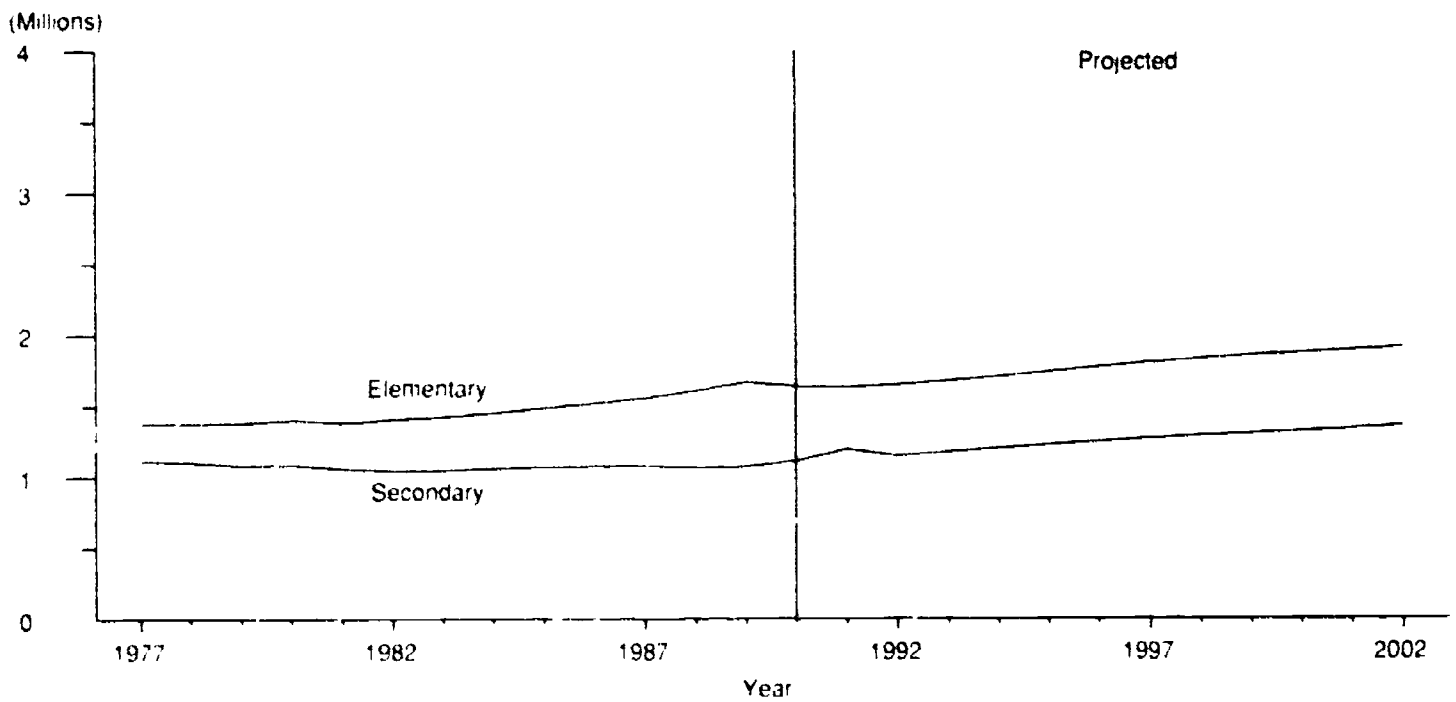


Figure 44

Average annual growth rates for classroom teachers, by organizational level

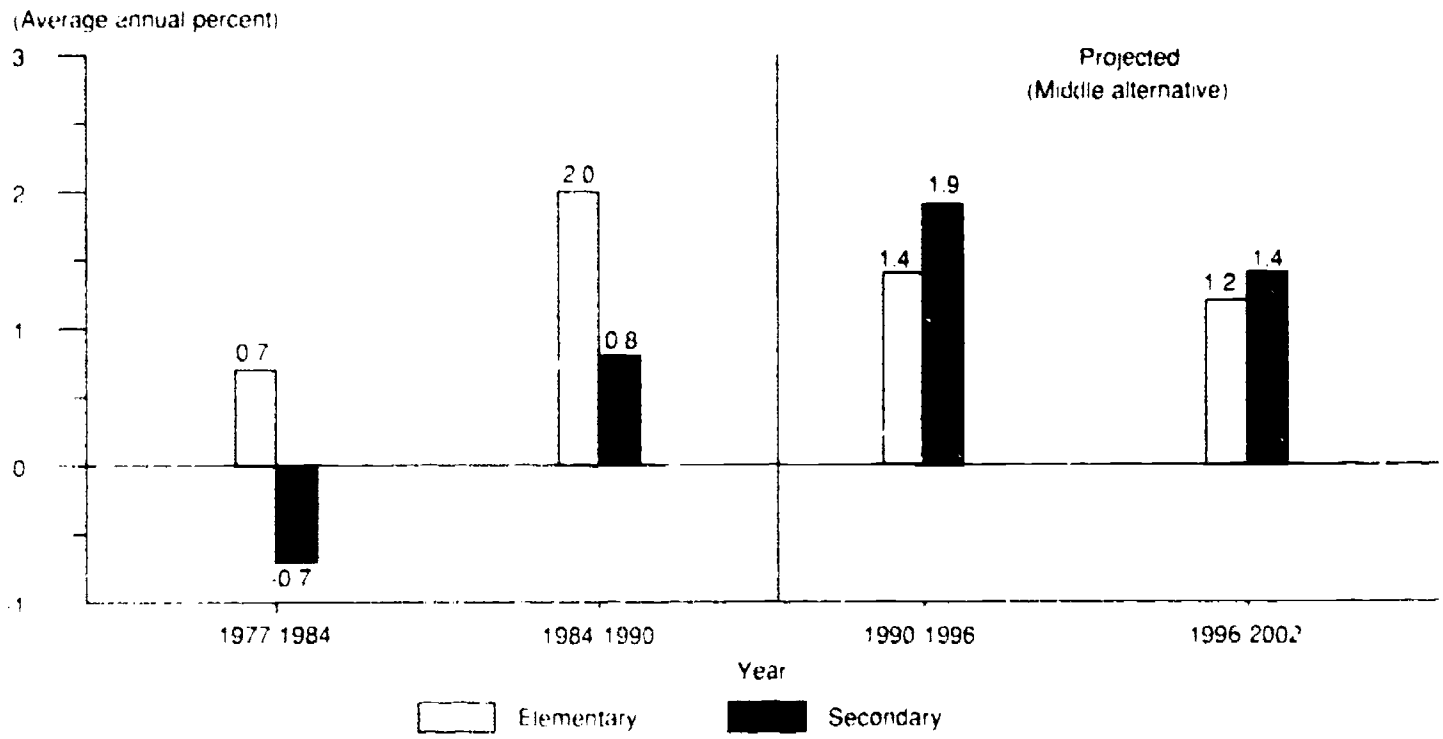


Figure 45

Elementary and secondary classroom teachers, by control of institution, with middle alternative projections: Fall 1977 to fall 2002

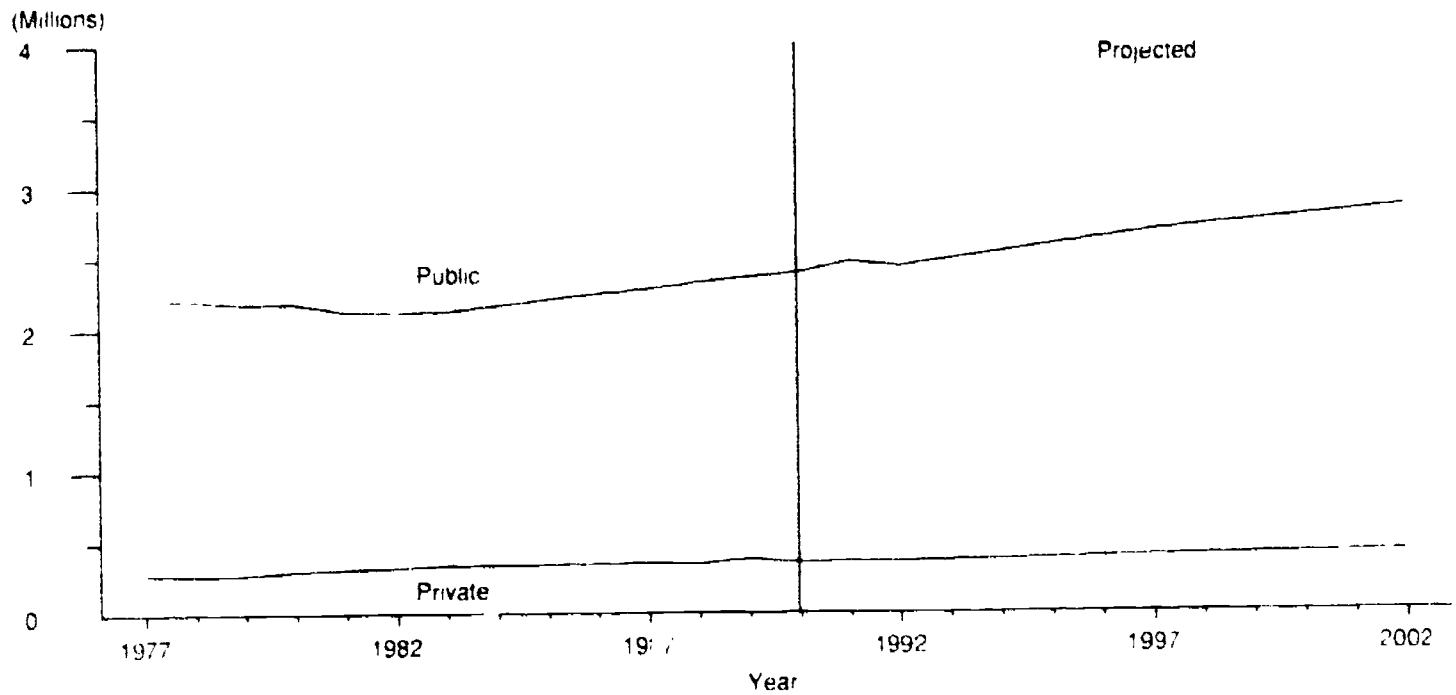


Figure 46

Average annual growth rates for classroom teachers, by control of institution

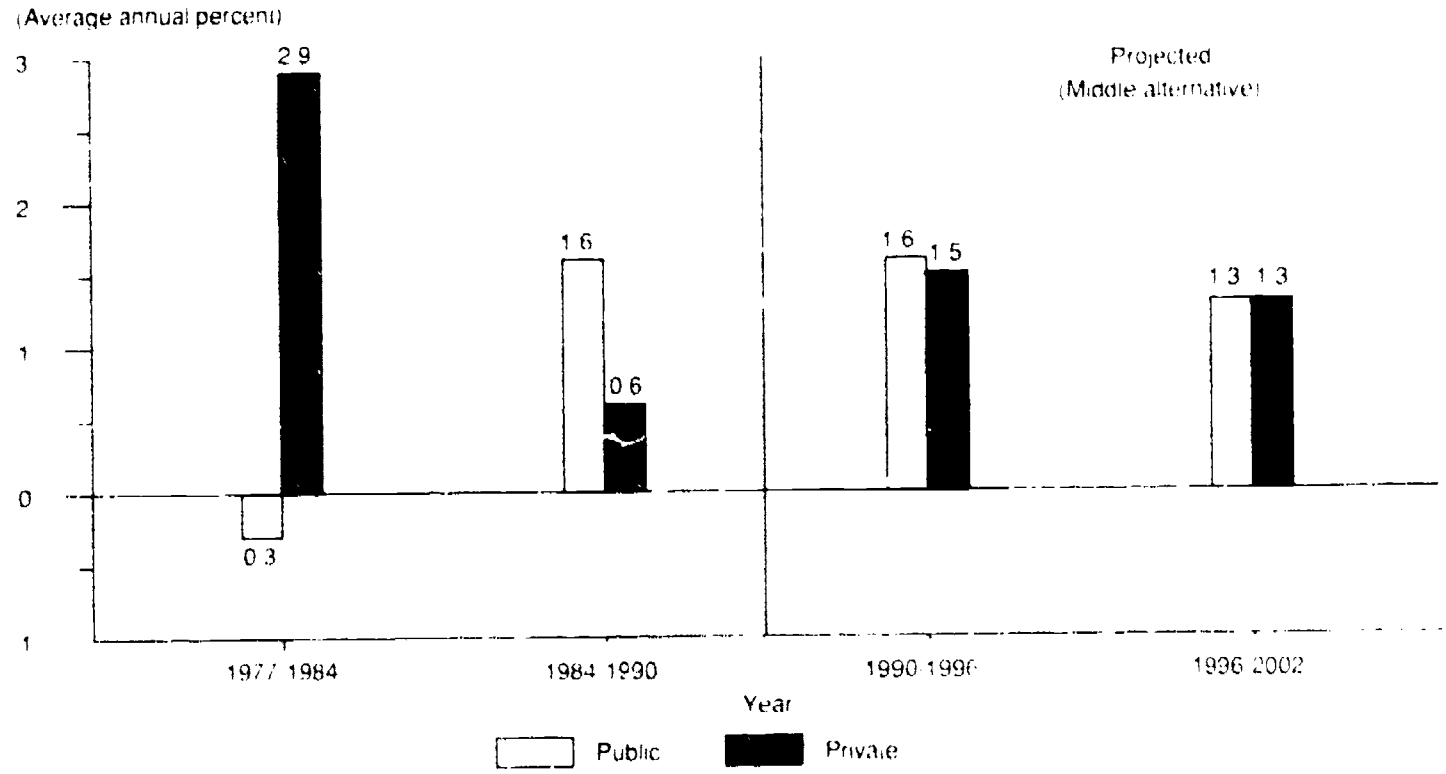


Figure 47

Pupil-teacher ratios, by organizational level, with middle alternative projections: Fall 1977 to fall 2002

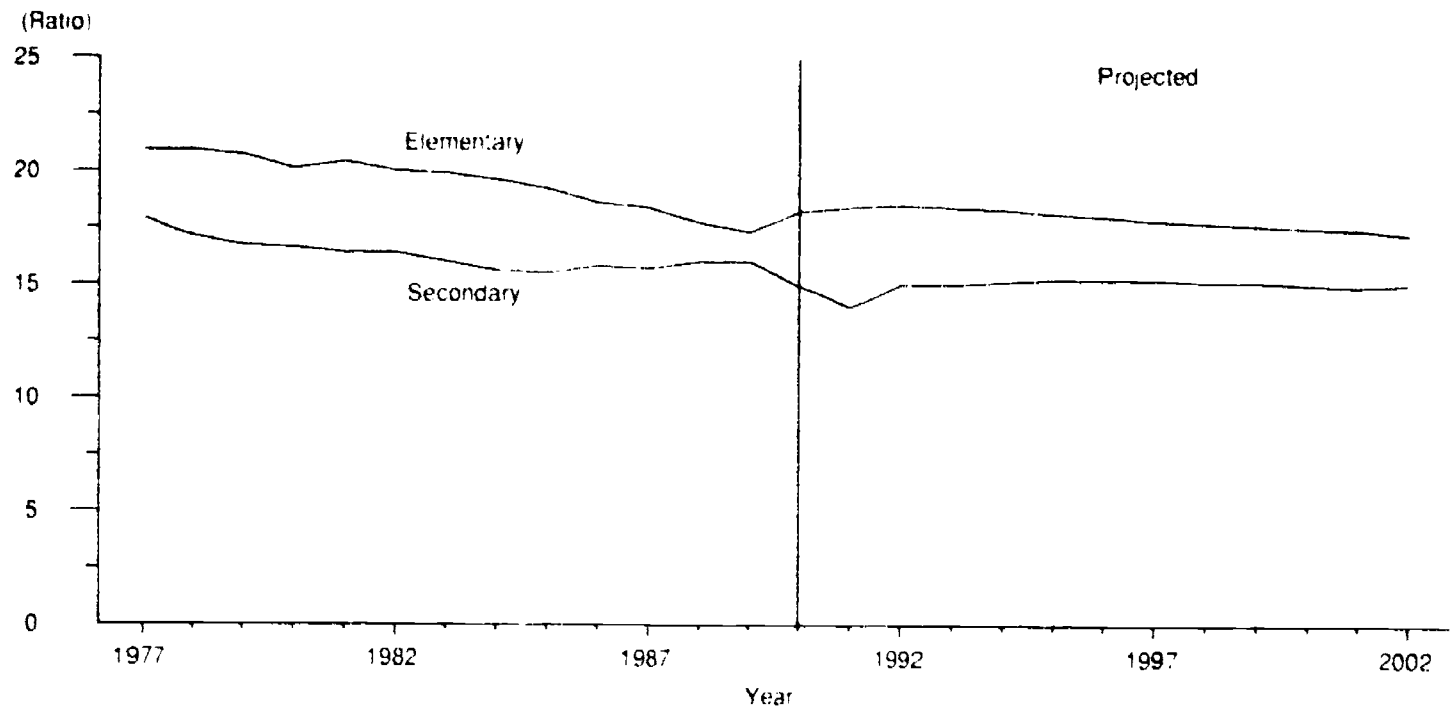


Figure 48

Pupil-teacher ratios, by organizational level and control, with middle alternative projections: Fall 1977 to fall 2002

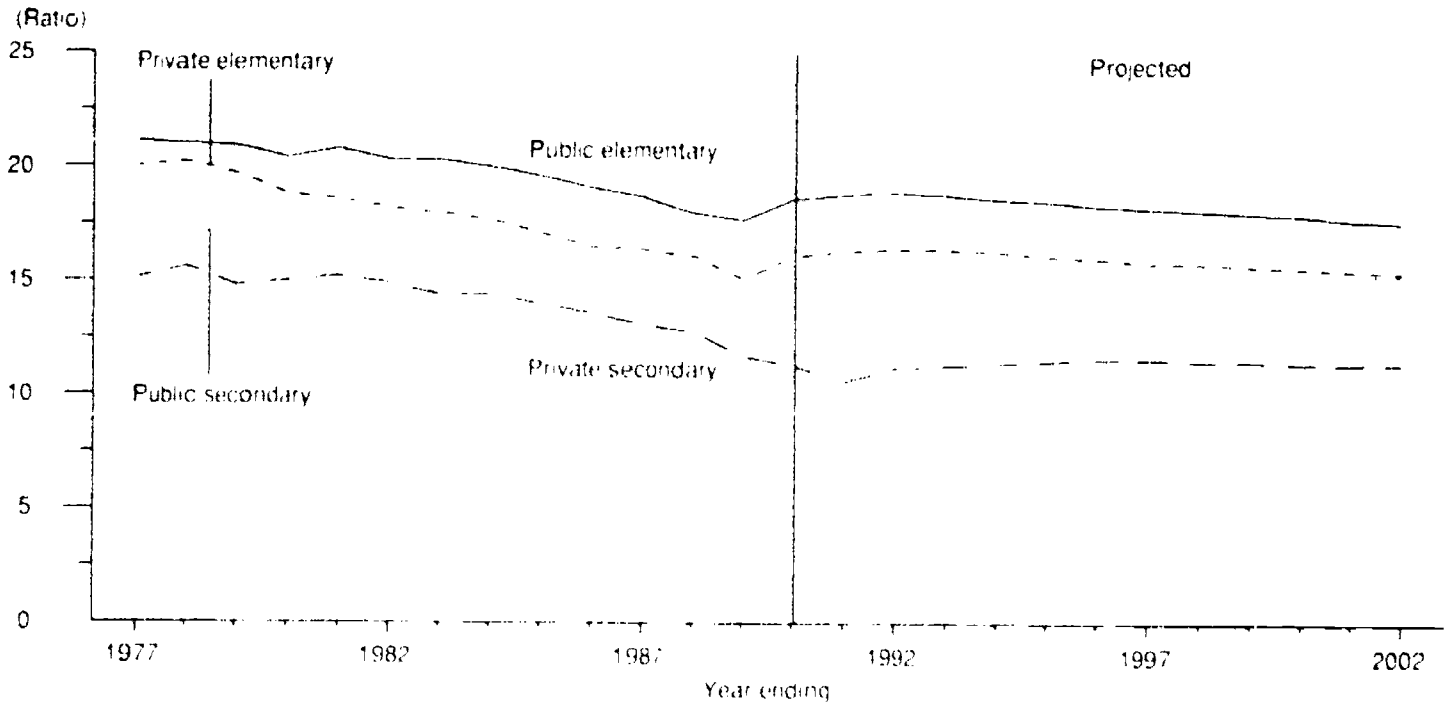


Table 32.—Classroom teachers in elementary and secondary schools, by control of institution and organizational level, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

(In thousands)

Year	Total			Public			Private		
	K–12	Elementary	Secondary	K–12	Elementary	Secondary	K–12	Elementary	Secondary
1977	2,488	1,375	1,113	2,209	1,185	1,024	279	190	89
1978	2,478	1,375	1,103	2,206	1,190	1,016	272	185	87
1979	2,459	1,378	1,081	2,183	1,190	993	276	188	88
1980	2,485	1,401	1,084	2,184	1,189	995	301	212	89
1981	2,438	1,380	1,057	2,125	1,159	967	313	221	92
1982	2,446	1,402	1,044	2,121	1,171	950	325	231	94
1983	2,463	1,418	1,045	2,126	1,178	948	337	240	97
1984	2,508	1,448	1,060	2,168	1,205	963	340	243	97
1985	2,550	1,483	1,067	2,207	1,237	970	343	246	97
1986	2,592	1,513	1,078	2,244	1,267	977	348	250	98
1987	2,631	1,554	1,077	2,279	1,297	982	353	257	95
1988	2,668	1,664	1,004	2,323	1,353	970	345	251	94
1989	2,734	1,664	1,070	2,386	1,389	998	377	275	102
1990[1]	2,744	1,632	1,112	2,391	1,379	1,012	353	253	100
Middle alternative projections									
1991	2,826	1,631	1,194	2,465	1,378	1,087	360	253	107
1992	2,791	1,648	1,146	2,433	1,389	1,044	358	255	103
1993	2,843	1,674	1,173	2,482	1,414	1,067	365	260	105
1994	2,902	1,704	1,198	2,530	1,439	1,090	372	264	108
1995	2,958	1,736	1,222	2,579	1,467	1,112	379	269	110
1996	3,015	1,770	1,245	2,628	1,495	1,133	387	275	112
1997	3,066	1,799	1,267	2,673	1,520	1,153	393	279	114
1998	3,107	1,824	1,283	2,709	1,541	1,167	398	283	115
1999	3,145	1,846	1,299	2,742	1,559	1,182	403	286	117
2000	3,181	1,866	1,316	2,774	1,576	1,198	408	289	118
2001	3,217	1,884	1,333	2,805	1,592	1,213	412	292	120
2002	3,254	1,903	1,351	2,838	1,608	1,230	417	295	122
Low alternative projections									
1991	2,825	1,631	1,194	2,465	1,378	1,087	360	253	107
1992	2,788	1,639	1,149	2,428	1,385	1,043	357	254	103
1993	2,831	1,662	1,170	2,469	1,404	1,064	363	258	105
1994	2,878	1,686	1,192	2,509	1,424	1,085	369	261	107
1995	2,928	1,713	1,212	2,550	1,447	1,103	378	266	109
1996	2,974	1,742	1,232	2,593	1,471	1,121	381	270	111
1997	3,015	1,764	1,251	2,629	1,490	1,139	386	274	113
1998	3,049	1,784	1,265	2,658	1,507	1,151	390	277	114
1999	3,079	1,801	1,278	2,685	1,521	1,163	394	279	115
2000	3,109	1,817	1,292	2,711	1,535	1,176	398	282	116
2001	3,137	1,830	1,306	2,738	1,547	1,189	401	284	117
2002	3,167	1,843	1,324	2,762	1,557	1,205	405	286	119
High alternative projections									
1991	2,836	1,639	1,196	2,474	1,385	1,089	362	254	108
1992	2,802	1,684	1,118	2,442	1,407	1,035	360	257	103
1993	2,862	1,687	1,176	2,498	1,428	1,070	367	262	106
1994	2,927	1,724	1,203	2,552	1,456	1,095	376	267	108
1995	2,991	1,763	1,227	2,608	1,488	1,117	384	274	110
1996	3,056	1,803	1,253	2,664	1,524	1,140	392	280	113
1997	3,118	1,838	1,280	2,718	1,555	1,164	400	285	115
1998	3,171	1,868	1,302	2,764	1,578	1,185	407	290	117
1999	3,217	1,893	1,324	2,804	1,600	1,205	413	294	119
2000	3,263	1,919	1,343	2,841	1,622	1,222	419	298	121
2001	3,303	1,944	1,360	2,881	1,643	1,238	424	302	122
2002	3,348	1,969	1,379	2,919	1,664	1,255	430	305	124

[1] Estimated by NCES.

Estimate.

NOTE: The numbers of elementary and secondary teachers reported separately by the National Education Association were prorated to the NCES totals for each year. Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of Public Elementary and Secondary Schools*, Common Core of Data surveys; Selected Public and Private Elementary and Secondary Education Statistics, *NCES Bulletin*, October 24, 1990; "Private Elementary and Secondary Education, 1983: Enrollment, Teachers, and Schools," *NCES Bulletin*, December 1984; 1988 Private School Survey; "Key Statistics for Private Elementary and Secondary Education, School Year 1988-89," *Early Estimates*; "Key Statistics for Private Elementary and Secondary Education, School Year 1989-90," *Early Estimates*; and "Key Statistics for Public and Private Elementary and Secondary Education, School Year 1990-91," *Early Estimates*. (This table was prepared April 1991.)

Table 33.—Pupil-teacher ratios in elementary and secondary schools, by control of institution and organizational level, with alternative projections: 50 States and D.C., fall 1977 to fall 2002

Year	Total		Public		Private	
	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary
1977	20.9	17.9	21.1	18.2	20.0	15.1
1978	20.9	17.1	21.0	17.3	20.2	15.6
1979	20.7	16.7	20.9	16.9	[1]19.7	14.8
1980	20.1	16.6	20.4	16.8	18.8	15.0
1981	20.4	16.4	20.8	16.5	[1]18.6	15.2
1982	20.0	16.4	20.3	16.6	[1]18.2	14.9
1983	19.9	16.0	20.3	16.1	18.0	14.4
1984	19.6	15.6	20.0	15.7	[1]17.7	14.4
1985	19.2	15.5	19.6	15.6	17.1	14.0
1986	18.6	15.8	19.1	16.0	[1]16.8	13.6
1987	18.4	15.7	18.7	16.0	[1]16.4	13.1
1988	17.7	16.0	18.0	16.3	16.1	12.8
1989	17.3	16.0	17.7	16.4	15.1	11.7
1990[2]	18.2	14.9	18.6	15.2	16.1	11.3
			Middle alternative projections			
1991	18.4	14.0	18.8	14.4	16.3	10.6
1992	18.5	15.0	18.9	15.3	16.4	11.2
1993	18.4	15.0	18.8	15.4	16.4	11.3
1994	18.3	15.1	18.6	15.5	16.3	11.4
1995	18.1	15.2	18.5	15.6	16.1	11.5
1996	18.0	15.2	18.3	15.6	16.0	11.6
1997	17.8	15.2	18.2	15.5	15.8	11.6
1998	17.7	15.1	18.1	15.5	15.8	11.5
1999	17.6	15.1	18.0	15.4	15.7	11.5
2000	17.5	15.0	17.9	15.3	15.6	11.4
2001	17.4	14.9	17.7	15.3	15.5	11.4
2002	17.2	15.0	17.6	15.3	15.4	11.4
			Low alternative projections (Based on high alternative projections of teachers)			
1991	18.3	14.0	18.7	14.4	16.2	10.6
1992	18.4	14.9	18.8	15.3	16.3	11.2
1993	18.3	15.0	18.6	15.4	16.2	11.2
1994	18.1	15.1	18.4	15.4	16.1	11.4
1995	17.8	15.1	18.2	15.5	15.9	11.5
1996	17.6	15.1	18.0	15.5	15.7	11.6
1997	17.5	15.0	17.8	15.4	15.5	11.5
1998	17.3	15.0	17.7	15.2	15.4	11.4
1999	17.2	14.8	17.5	15.1	15.3	11.3
2000	17.0	14.7	17.4	15.0	15.2	11.2
2001	16.9	14.6	17.2	15.0	15.0	11.1
2002	16.6	14.7	17.0	15.0	14.9	11.3
			High alternative projections (Based on low alternative projections of teachers)			
1991	18.4	14.0	18.8	14.4	16.3	10.6
1992	18.6	15.0	19.0	15.3	16.5	11.3
1993	18.5	15.1	18.9	15.4	16.5	11.3
1994	18.5	15.2	18.8	15.6	16.4	11.5
1995	18.4	15.3	18.7	15.7	16.4	11.6
1996	18.3	15.4	18.6	15.7	16.2	11.7
1997	18.2	15.4	18.6	15.7	16.2	11.8
1998	18.1	15.3	18.5	15.7	16.1	11.7
1999	18.1	15.3	18.4	15.7	16.1	11.7
2000	18.0	15.3	18.4	15.6	16.0	11.6
2001	17.9	15.2	18.3	15.6	16.0	11.6
2002	17.8	15.3	18.1	15.6	15.9	11.6

[1] Estimated by NCES.
[2] Estimate.

NOTE: Pupil-teacher ratios were derived from tables 3 and 37. Some data have been revised from previously published figures. Projections are based on data through 1989. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of Public Elementary and Secondary Schools*, Common Core of Data surveys; Selected Public and Private Elementary and Secondary Education Statistics, *NCES Bulletin*, October 23, 1979; Private Elementary and Secondary Education, 1983, Enrollment, Teachers, and Schools, *NCES Bulletin*, December 1984; 1988 Private School Survey; Key Statistics for Private Elementary and Secondary Education, School Year 1988-89, *Early Estimates*; Key Statistics for Private Elementary and Secondary Education, School Year 1989-90, *Early Estimates*; and Key Statistics for Public and Private Elementary and Secondary Education, School Year 1990-91, *Early Estimates*. (This table was prepared April 1991.)

Chapter 6

Expenditures of Public Elementary and Secondary Schools

Current expenditures are projected to increase by 37 percent and average annual teacher salaries in public elementary and secondary schools are projected to increase by 18 percent between school years 1991-92 and 2001–2002 in the middle-high set of projections presented in this chapter. These projections are based on assumptions concerning economic growth and assistance by state governments to local governments; these assumptions are discussed in this chapter. Other sets of projections, based on alternative economic scenarios, are also discussed.

Current Expenditures

Past Trends

Current expenditures, which had already been in a period of growth, have continued to increase since 1976–77. These expenditures, in constant 1989–90 dollars, amounted to $144.7 billion in 1976–77 and are expected to reach $188.1 billion in 1990–91, an increase of 30 percent (table 34 and figure 49). At the same time, current expenditures per pupil in average daily attendance rose 40 percent over 1976–77 expenditures, to an estimated $4,953 in 1990–91 (table 34 and figures 50 and 51). Current expenditures per pupil in fall enrollment (table 35) also rose 40 percent. Expenditures per pupil rose more rapidly than current expenditures because of a decline in enrollment.

Disposable income per capita has increased substantially since 1976–77, enabling more money to be spent on education. (See figure 52 for a comparison of the growth rates of current expenditures per pupil and disposable income per capita.)

There was also a rapid rise in state education aid to local governments during the period from 1976–77 to 1990–91. As education revenue from state sources increased, local governments increased spending on education. (See figure 53 for a comparison of the growth rates of current expenditures per pupil and revenue receipts from state sources per capita).

Another factor resulting in higher current expenditures per pupil has been the decrease in the ratio of number of pupils to the population as a whole; that is, the fewer pupils per person, the more money can be spent per pupil with the same level of per capita revenue.

The only time in the past 15 years in which current expenditures decreased was from 1978–79 to 1981–82. The following three events may account for part of that decline. First, disposable income per capita and state education aid per capita were in periods of either slow growth or decline at that time. Second, this was the period of the "tax revolt," when many voters expressed their displeasure at the spending habits of state or local governments by voting for measures that would limit either taxes or spending. It was also a period of high inflation, when state and local governments may have had difficulty anticipating the rapid rise in school costs.

The percentage of total disposable income spent on public elementary and secondary current expenditures fell from 5.4 percent in 1976–77 to 4.9 percent in 1990–91, partly as a result of the 7.0 percent decline in enrollments that occurred during that period. In comparison, the population grew by 15.3 percent during that period.

Continuing an earlier trend, current expenditures per pupil as a percentage of disposable income per capita rose from 28.9 percent in 1976–77 to an estimated 32.8 percent in 1990–91. With fewer students, there was more money to be spent per student.

Alternative Projections

The economic climate of the nation and the amount of revenue receipts from state government to local government for education are important factors in determining the level of spending on elementary and secondary education (and revenue receipts from states are influenced by the state of the economy). Regression equations were used to develop the forecasts for current expenditures, with a measure of the state of the economy (disposable income per capita) and the amount of revenue receipts from state sources for education used as two of the factors influencing current expenditures. Several plausible growth paths for disposable income per capita and revenue receipts from state sources were used to produce alternative sets of projections for current expenditures.

For any of the sets of alternative forecasts to be close to the actual values, the underlying assumptions should resemble what actually occurs. It is also important that the relationships that have existed among the variables in the past continue throughout the projection period.

Four sets of projections are presented for current expenditures in this chapter. These sets of forecasts are

based on alternative projections for disposable income per capita and local government revenue receipts from state sources per capita. The forecasts for disposable income per capita were developed by The WEFA Group, an economic consulting firm, and the forecasts for revenue receipts from state sources were developed using forecasts from The WEFA Group. The assumptions underlying each set of alternative projections for current expenditures are described briefly. For more information about these assumptions and about the methodology used to compute these forecasts, see appendix A5.

The middle-high alternative projections are based on the assumptions that disposable income per capita will increase at rates between 0.3 and 2.1 percent during the period from 1991–92 to 2001–2002 and that revenue receipts from state sources per capita will increase at rates between 1 percent and 2.1 percent.

The low alternative projections are based on the assumptions that disposable income per capita will change at rates between minus 0.3 and 1.7 percent and that revenue receipts from state sources per capita will increase at rates between 0.6 percent and 1.8 percent.

The middle-low alternative projections are based on the assumptions that disposable income will increase at rates between 0.3 and 2.1 percent and that revenue receipts from state sources will increase at rates between 0.6 percent and 1.8 percent.

The high alternative projections are based on the assumptions that disposable income will increase at rates between 0.4 and 2.4 percent and that revenue receipts from state sources will increase at rates between 1.1 percent and 3.8 percent.

A third factor influencing the growth in current expenditures in these projections is the ratio of enrollment (as measured by average daily attendance) to the population. The same projections for enrollment and the population are used in the production of all sets of projections for current expenditures presented in this chapter.

Enrollments are projected to increase steadily during the forecast period. This steady increase should have a negative impact on expenditures per pupil. However, this increase in enrollment may also have a strong positive effect on total expenditures. With enrollments rising, there will be a change in the previous trend of total expenditures growing at a lower rate than expenditures per pupil.

In the middle-high alternative projections, current expenditures in constant 1989–90 dollars are projected to grow slowly at first, as the economy comes out of the 1990–91 downturn, and then to rise at a steady pace thereafter, reaching $257.7 billion in 2001–2002. This is an increase of 37 percent over the estimated level for 1990–91. Current expenditures per pupil in average daily attendance are projected to increase by 20 percent, to $5,951 (table 34 and figures 50 and 51). As mentioned above, due to the increases projected for enrollments, total current expenditures are projected to increase more rapidly than expenditures per pupil.

In the middle-high alternative projection, total current expenditures per pupil as a percentage of total disposable income are projected to increase from 4.9 percent to 5.2 percent. One cause of this projected increase is the 14-percent increase in enrollment projected for this period.

Current expenditures per pupil as a percentage of disposable income per capita are also projected to increase, from 32.8 percent to 33.4 percent. This increase is small compared with that which occurred from 1976–77 to 1990–91. The rapid increase projected for enrollment compared with the increase projected for the population (14 percent for enrollment, 9.1 percent for the population) is one cause of this relatively small increase.

In the low alternative projections, disposable income per capita is assumed to stay virtually unchanged from 1990–91 to 1991–92 and revenue receipts from state sources per capita are assumed to fall slightly. The combination of these two events would result in total current expenditures rising only slightly from 1990–91 to 1991–92; expenditures per pupil would fall slightly. For the rest of the forecast period, steady but slow growth is projected. Current expenditures are projected to increase by 31 percent, to $246.4 billion in 2001–2002. Current expenditures per pupil in average daily attendance are projected to increase by 15 percent, to $5,689.

The middle-low set of projections is based on the projections for disposable income per capita used to produce the middle-high projections and the projections for revenue receipts from state sources used to produce the low projections. As would be expected, in the middle-low set of projections expenditures are projected to increase at rates between those of the other two alternatives. Current expenditures per pupil are predicted to fall from 1990–91 to 1991–92 and then rise at rates usually between those of the middle-high and low sets of projections. Over the course of the projection period, current expenditures are projected to increase by 34 percent, to $251.9 billion, and current expenditures per pupil in average daily attendance are projected to increase by 17 percent, to $5,817.

In the high alternative projections, both disposable income per capita and revenue receipts from state sources are projected to increase more rapidly than in the middle-high set of projections. As a result, both current expenditures and current expenditures per pupil are projected to increase more rapidly than in the middle-high set of projections. Current expenditures are projected to increase by approximately 45 percent, to $272.1 billion in 2001–2002. Current expenditures per pupil in average daily attendance are projected to increase by 27 percent, to $6,284.

Salaries

Recent History

The period from 1976–77 to 1990–91 has been dominated by two sharply different patterns for teacher salaries in constant dollars (see table 36 and figures 54 and 55).

Teacher salaries, already in a period of decline, fell 10 percent from 1976–77 to 1980–81, from $28,895 to $25,875 (average annual salary) in constant 1989–90 dollars. The period of greatest decline coincided with the period when the decline in enrollments was greatest. (See figure 56 for a comparison of the growth rates for teacher salaries and average daily attendance.) It also coincided with the period when the economy and current expenditures were falling.

After this period of decline, teacher salaries entered a period of steady increase, surpassing, in 1985–86, their 1976–77 level. From 1980–81 to 1989–90, the average teacher salary increased by 21 percent, reaching $31,331 in 1989–90. It was during that period when enrollment, which had also been in a period of steady decline, began increasing again. It was also a period when the economy and current expenditures were steadily increasing.

The greatest increases came early in that period, with an increase of more than 2 percent occurring in every year from 1982–83 to 1986–87. For the next 3 years, the increases were smaller, ranging from 0.8 to 1.3 percent. With the 1990–91 downturn in the economy, teacher salaries remained virtually unchanged from their 1989–90 level, falling slightly from an average of $33,331 in 1989–90 to an estimated $33,204 in 1990–91.

In the 1970s, the number of people preparing to become teachers was much greater than the number of openings for newly qualified teachers. The drop in teacher salaries during this time may be attributed, in part, to excess supply. Then the number of people preparing to become teachers dropped, and eventually, the decline in teacher salaries stopped. Some of the increase in teacher salaries that occurred during the 1980s may be a result of the reforms enacted to encourage more people to enter the teaching profession.

Alternative Projections

As with current expenditures, a multiple linear regression model was developed for teacher salaries. Teacher salaries are seen as being related to current expenditures and enrollments. (See appendix A5.) Also like current expenditures, these projections depend on the projections of these inputs, and assume that the relationships that have existed among the variables in the past will continue throughout the projection period.

Four sets of alternative projections of teacher salaries—middle-high, low, middle-low, and high—have been developed. Each alternative is based on one of the alternative sets of projections for current expenditures presented earlier in this chapter.

The projections for average daily attendance were produced by using the growth rates of the projections for fall enrollment presented in chapter 1. The same projections for average daily attendance were used for each of the four sets of projections for teacher salaries. Enrollments are projected to increase throughout the projection period, with the greatest percent increase occurring in the early and mid-1990s.

In the middle-high alternative projection, the average teacher salary in constant 1989–90 dollars is projected to reach $36,675 in 2001–2002 (table 36, figure 54). This is an 18-percent increase from the level estimated for 1990–91. The greatest percent increases in salaries are projected to occur from 1991–92 to 1995–96. One reason for this is that this period is when the most rapid increases in enrollments are projected (see figure 56).

In the low alternative projections, teacher salaries are projected to rise during the period, although at a lower rate than in the middle alternative projections. The average salary is projected to reach $35,529 in 2001–2002, an increase of about 14 percent. (See figure 55 for a comparison of the growth rates for the alternative sets of projections.)

In the middle-low alternative projections, the average teacher salary is projected to reach $36,089 in 2001–2002, an increase of about 16 percent.

In the high alternative projection, the average teacher salary is projected to reach $38,138 in 2001–2002, an increase of about 22 percent.

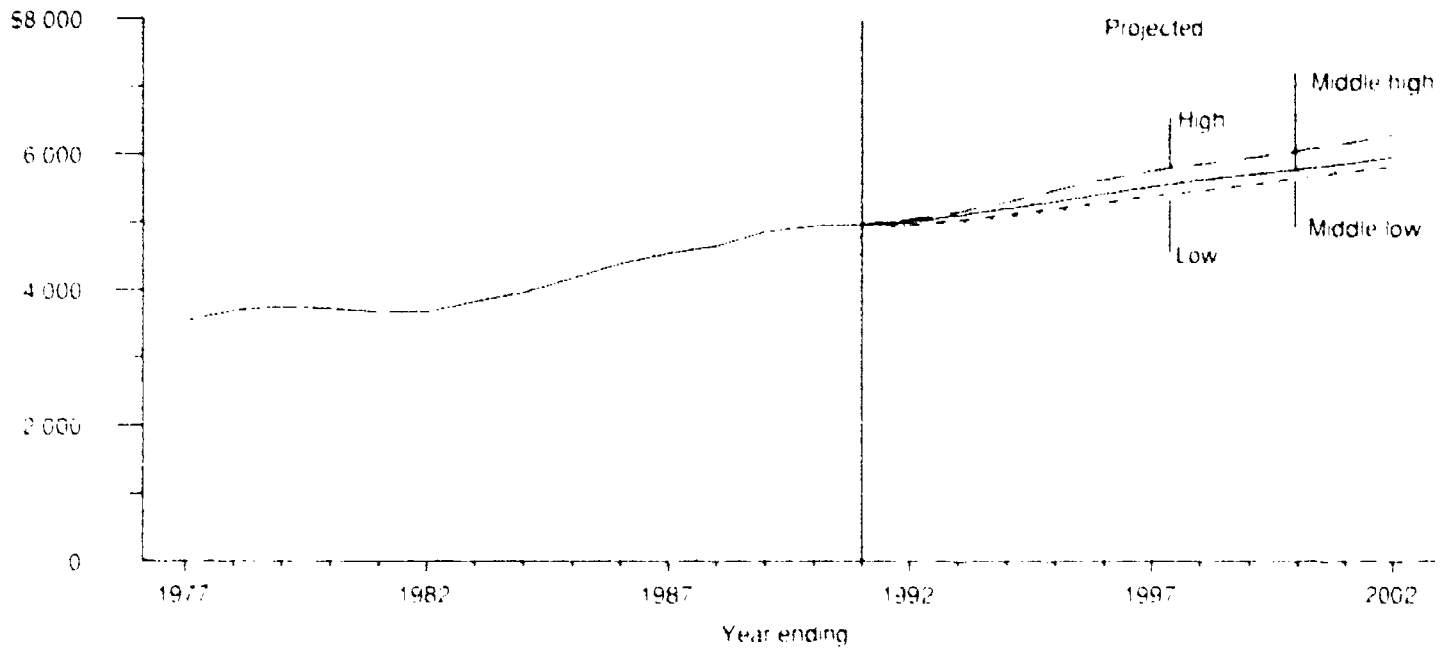
Figure 49

Current expenditures of public schools (in constant 1989-90 dollars), with alternative projections: 1976-77 to 2001-2002

NOTE Data for 1990-91 are estimated by using past data

Figure 50

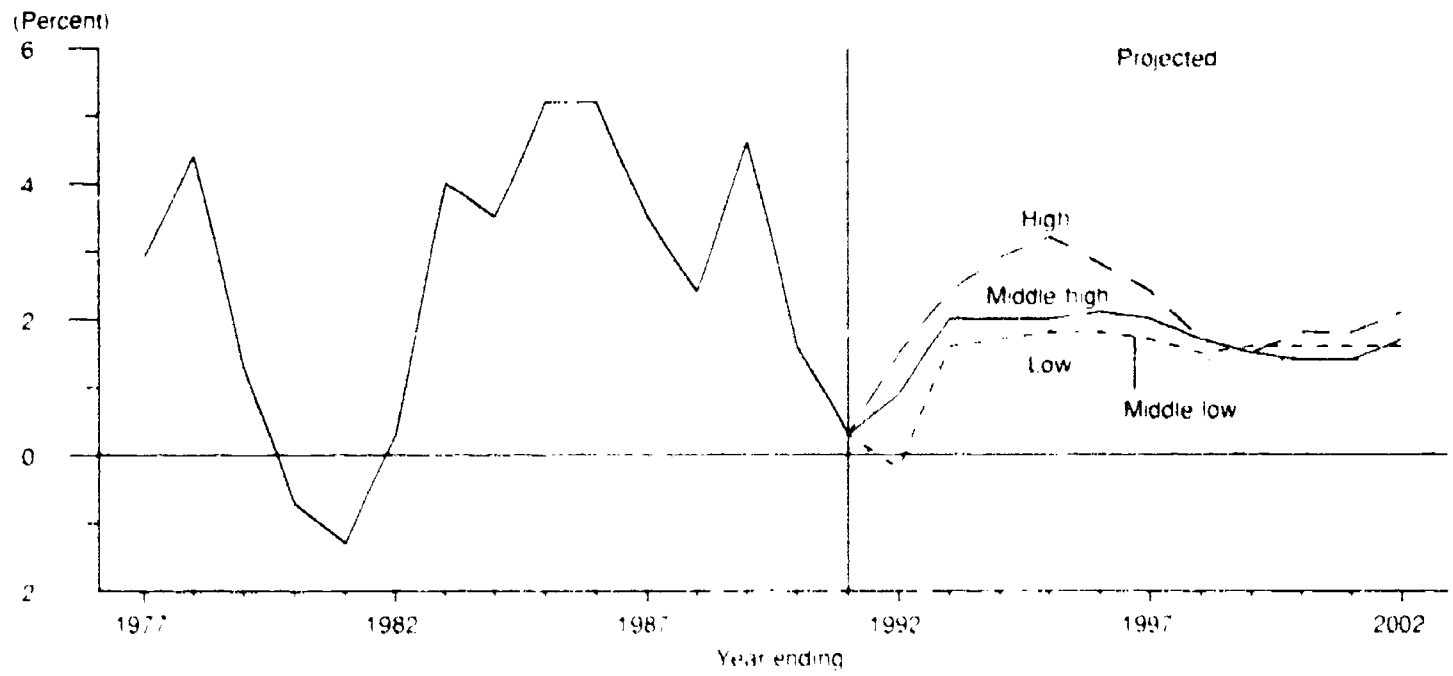
Current expenditures per pupil in average daily attendance (in constant 1989-90 dollars) of public schools, with alternative projections: 1976-77 to 2001-2002



NOTE Data for 1990-91 are estimated by using past data

Figure 51

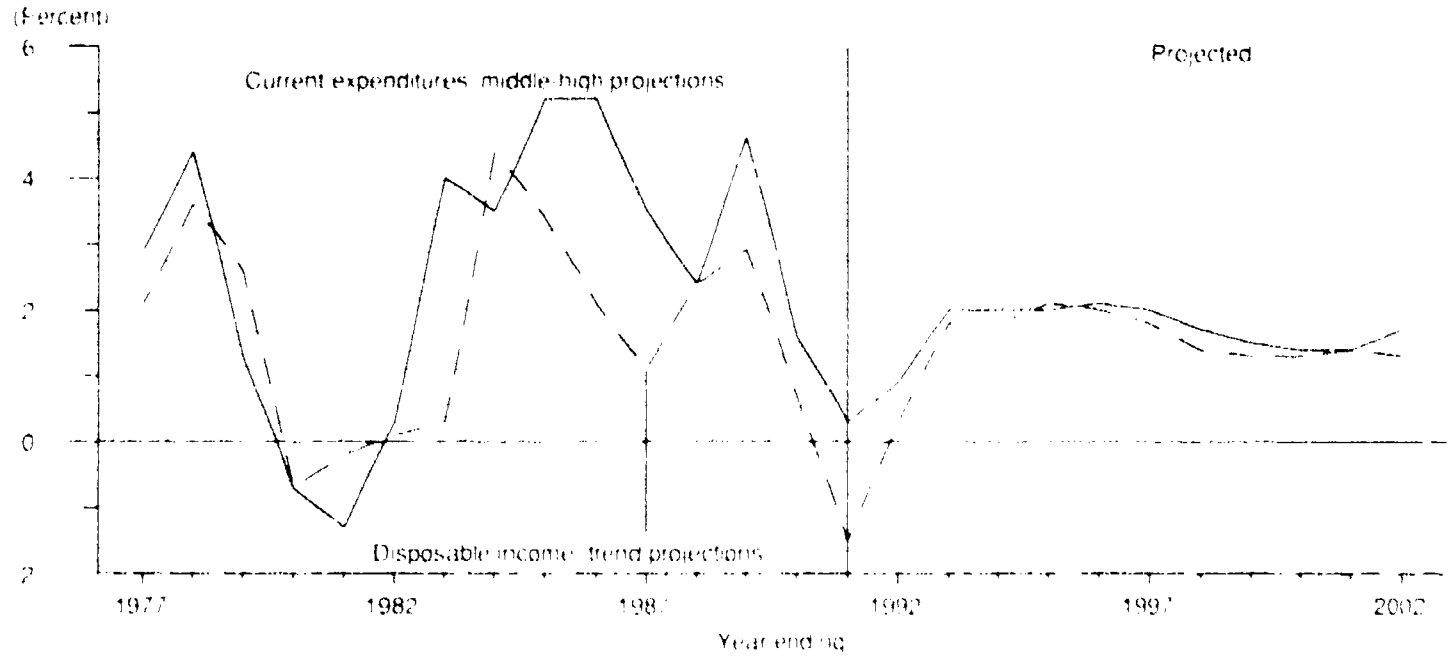
Percent change in current expenditures per pupil in average daily attendance (in constant 1989-90 dollars) of public schools, with alternative projections: 1976-77 to 2001-2002



NOTE Data for 1990-91 are estimated by using past data

Figure 52

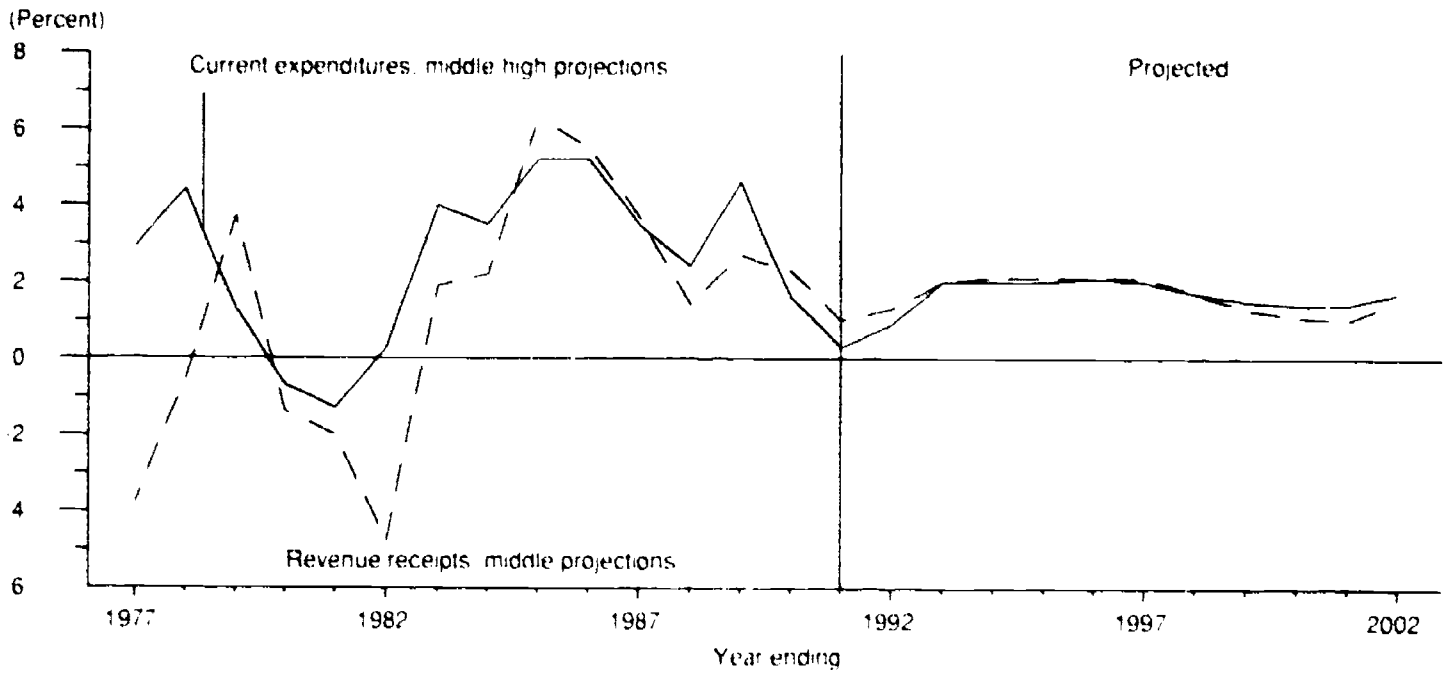
Percent change in current expenditures per pupil in average daily attendance of public schools and disposable personal income per capita (both in constant 1989-90 dollars), with projections: 1976-77 to 2001-2002



NOTE Data for 1990-91 are estimated by using past data

Figure 53

Percent change in current expenditures per pupil in average daily attendance of public schools and education revenue receipts from state sources per capita (both in constant 1989-90 dollars), with projections: 1976-77 to 2001-2002



NOTE Data for 1990-91 are estimated by using past data

Figure 54

Average annual salaries of teachers (in constant 1989-90 dollars) in public schools, with alternative projections: 1976-77 to 2001-2002

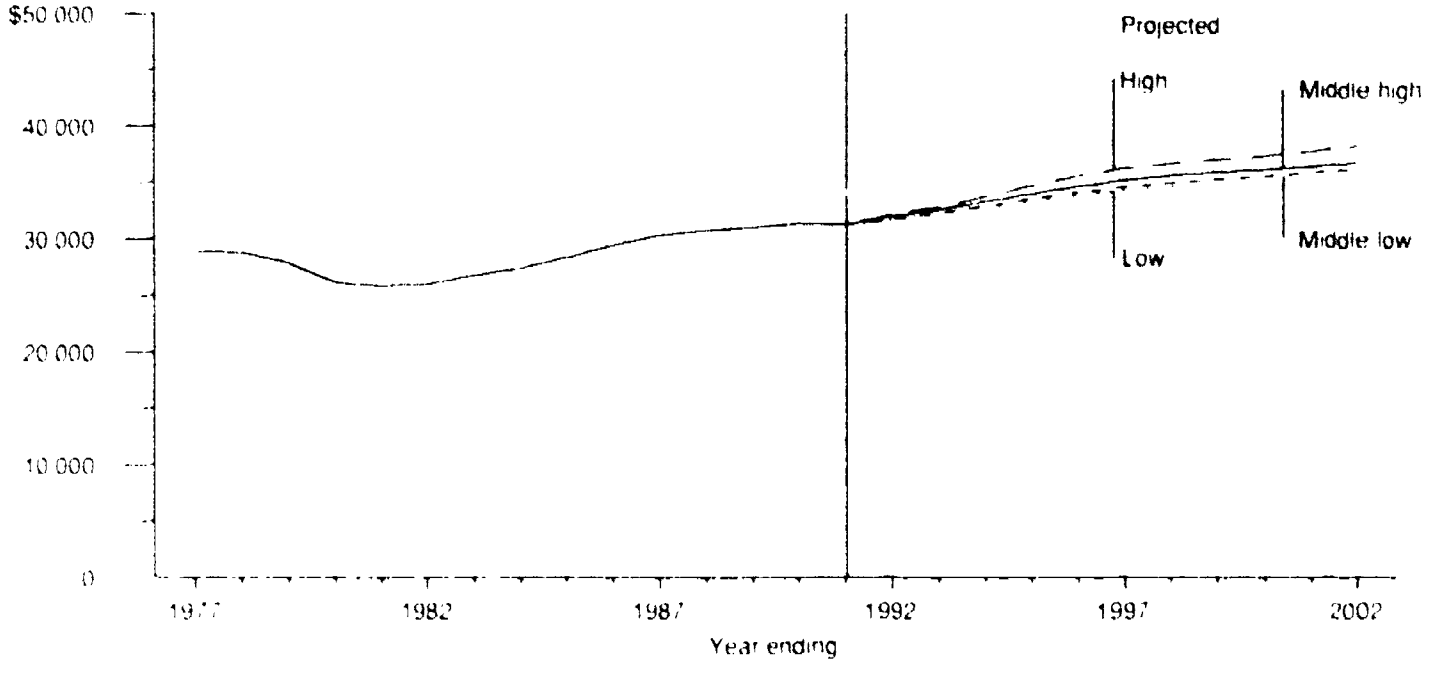


Figure 55

Percent change in average annual salaries of teachers (in constant 1989-90 dollars) in public schools, with alternative projections: 1976-77 to 2001-2002

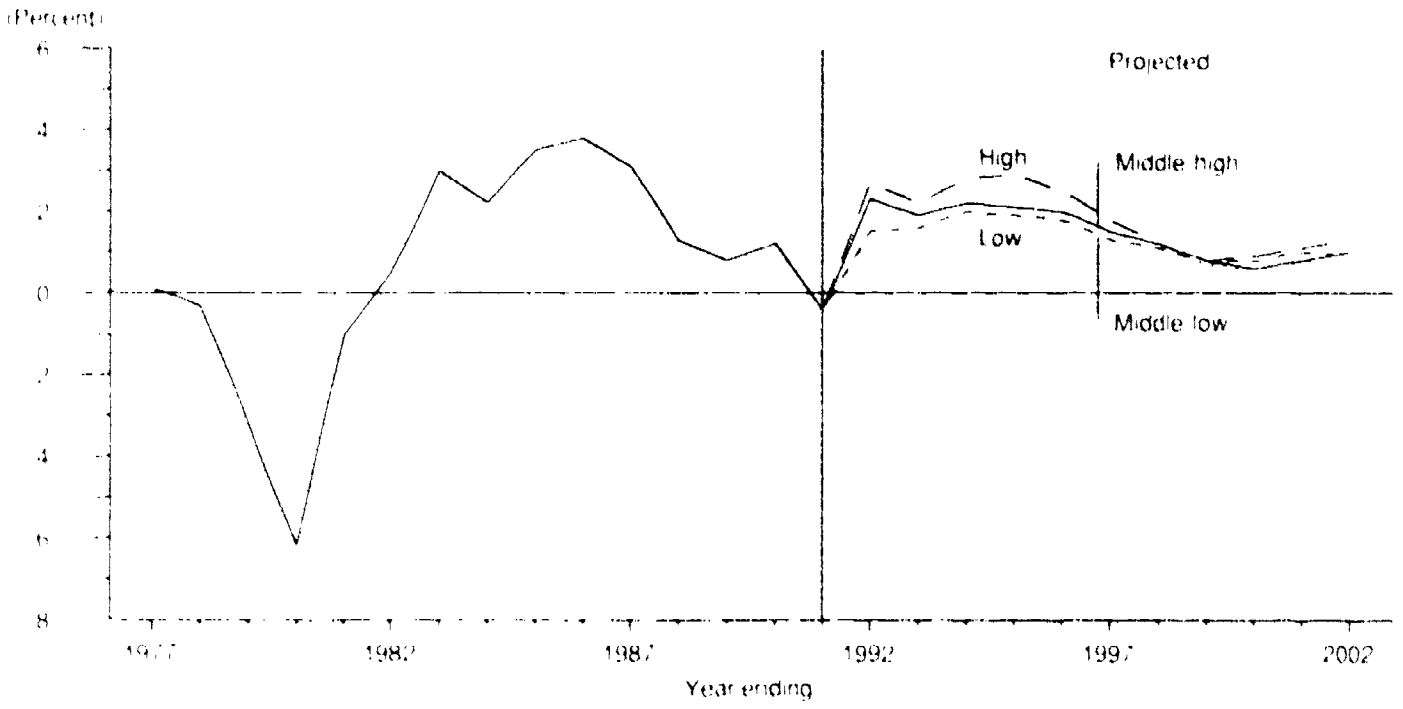


Figure 56

Percent change in average annual salaries of teachers (in constant 1989-90 dollars) in public schools and average daily attendance, with projections: 1976-77 to 2001-2002

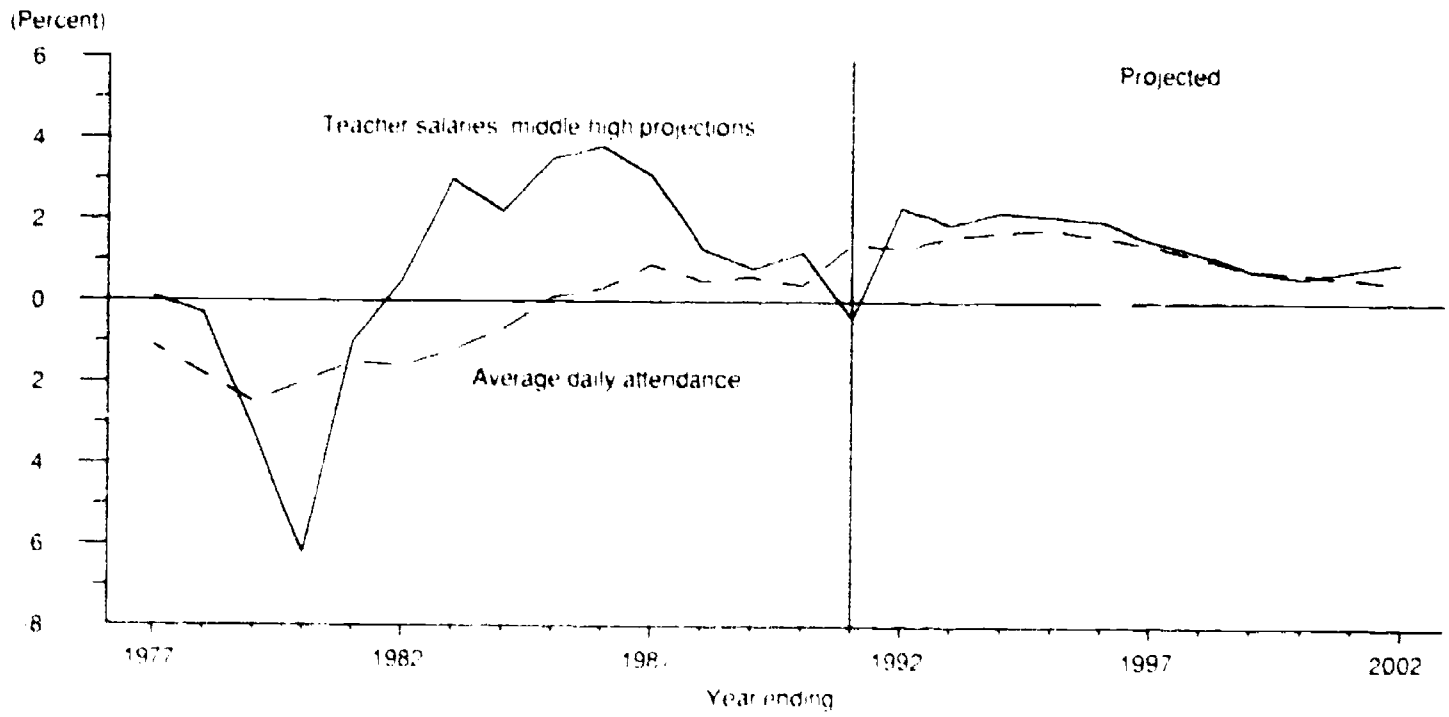


Table 34.—Current expenditures and current expenditures per pupil in average daily attendance (ADA) in public elementary and secondary schools, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

School year ending	ADA (in thousands)	Current expenditures			
		Constant 1989–90 dollars[1]		Current dollars[2]	
		Total (in billions)	Per pupil in ADA	Total (in billions)	Per pupil in ADA
1977	40,832	$144.7	$3,543	$66.9	$1,638
1978	40,080	148.2	3,698	73.1	1,823
1979	39,076	146.4	3,747	79.0	2,020
1980	38,289	142.4	3,719	87.0	2,272
1981	37,704	138.3	3,669	94.3	2,502
1982	37,095	136.4	3,678	101.1	2,726
1983	36,636	140.1	3,824	108.3	2,955
1984	36,363	144.0	3,960	115.4	3,173
1985	36,403	151.7	4,167	126.3	3,470
1986	36,523	160.0	4,381	137.2	3,756
1987	36,864	167.2	4,536	146.6	3,976
1988	37,051	172.2	4,647	157.1	4,240
1989	37,282	181.2	4,860	172.9	4,639
1990[3]	37,511	185.2	4,938	185.2	4,938
1991[3]	37,974	188.1	4,953	199.0	5,240
Middle-high alternative projections					
1992	38,482	192.3	4,996	211.4	5,492
1993	39,107	199.2	5,095	226.9	5,803
1994	39,774	206.6	5,195	246.2	6,191
1995	40,494	214.6	5,299	268.4	6,629
1996	41,136	222.5	5,409	291.8	7,094
1997	41,721	230.2	5,518		
1998	42,194	236.8	5,611		
1999	42,536	242.2	5,693		
2000	42,833	247.2	5,771		
2001	43,077	252.0	5,850		
2002	43,302	257.7	5,951		
Low alternative projections					
1992	38,482	190.0	4,937	207.4	5,389
1993	39,107	195.6	5,001	221.8	5,671
1994	39,774	201.8	5,074	239.6	6,023
1995	40,494	208.7	5,153	260.3	6,429
1996	41,136	215.4	5,236	282.2	6,860
1997	41,721	221.6	5,312		
1998	42,194	227.2	5,384		
1999	42,536	232.1	5,457		
2000	42,833	237.1	5,535		
2001	43,077	241.8	5,613		
2002	43,302	246.4	5,689		
Middle-low alternative projections					
1992	38,482	190.1	4,941	209.0	5,432
1993	39,107	196.2	5,018	223.5	5,715
1994	39,774	203.0	5,103	241.9	6,081
1995	40,494	210.3	5,194	263.1	6,497
1996	41,136	217.4	5,285	285.1	6,932
1997	41,721	224.3	5,378		
1998	42,194	230.3	5,458		
1999	42,536	235.8	5,543		
2000	42,833	241.3	5,633		
2001	43,077	246.6	5,725		
2002	43,302	251.9	5,817		

Table 34.—Current expenditures and current expenditures per pupil in average daily attendance (ADA) in public elementary and secondary schools, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002—Continued

Year ending	ADA (in thousands)	Current expenditures			
		Constant 1989–90 dollars[1]		Current dollars[2]	
		Total (in billions)	Per pupil in ADA	Total (in billions)	Per pupil in ADA
High alternative projections					
1992	38,482	$193.4	$5,027	$211.0	$5,482
1993	39,107	201.3	5,146	227.5	5,818
1994	39,774	210.6	5,296	248.5	6,249
1995	40,494	221.3	5,465	273.4	6,751
1996	41,136	231.1	5,619	298.8	7,264
1997	41,721	240.1	5,756	.	.
1998	42,194	247.0	5,853		
1999	42,536	252.6	5,939		
2000	42,833	258.9	6,045		
2001	43,077	265.0	6,152		
2002	43,302	272.1	6,284		

[1] Based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor.

[2] Projections in current dollars are not shown after 1996 due to the uncertain behavior of inflation over the long term.

[3] Current expenditures are early estimates. Average daily attendance is estimated on the basis of past data.

[4] Estimated on the basis of past data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems, Revenues and Expenditures for Public Elementary and Secondary Education*; Common Core of Data survey, and "Key Statistics for Public Elementary and Secondary Education: School Year 1990-91," *Early Estimates*, and National Education Association, annual *Estimates of State School Statistics* (Latest edition 1990-91. Copyright 1991 by the National Education Association. All rights reserved.) (This table prepared May 1991.)

Table 35.—Current expenditures and current expenditures per pupil in fall enrollment in public elementary and secondary schools, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Fall enrollment[1] (in thousands)	Current expenditures			
		Constant 1989–90 dollars[2]		Current dollars[3]	
		Total (in billions)	Per pupil in fall enrollment	Total (in billions)	Per pupil in fall enrollment
1977	44,317	$144.7	$3,265	$66.9	$1,509
1978	43,522	148.2	3,401	73.1	1,677
1979	42,580	146.4	3,441	79.0	1,855
1980	41,648	142.4	3,419	87.0	2,089
1981	40,918	138.3	3,380	94.3	2,305
1982	40,022	136.4	3,409	101.1	2,526
1983	39,566	140.1	3,541	108.3	2,736
1984	39,252	144.0	3,669	115.4	2,940
1985	39,208	151.7	3,869	126.3	3,222
1986	39,422	160.0	4,059	137.2	3,479
1987	39,753	167.2	4,207	146.6	3,687
1988	40,008	172.2	4,303	157.1	3,927
1989	40,189	181.2	4,508	172.9	4,303
1990[4]	40,526	185.2	4,571	185.2	4,571
1991[5]	41,026	188.1	4,584	199.0	4,850
Middle-high alternative projections					
1992	41,578	192.3	4,625	211.4	5,084
1993	42,280	199.2	4,716	226.9	5,371
1994	42,971	206.6	4,809	246.2	5,730
1995	43,749	214.6	4,905	268.4	6,136
1996	44,442	222.5	5,007	291.8	6,566
1997	45,074	230.2	5,107		
1998	45,585	236.8	5,194		
1999	45,955	242.2	5,270		
2000	46,276	247.2	5,342		
2001	46,539	252.0	5,415		
2002	46,782	257.7	5,508		
Low alternative projections					
1992	41,578	190.0	4,569	207.4	4,988
1993	42,280	195.6	4,629	221.8	5,249
1994	42,971	201.8	4,696	239.6	5,575
1995	43,749	208.7	4,770	260.3	5,951
1996	44,442	215.4	4,846	282.2	6,350
1997	45,074	221.6	4,917		
1998	45,585	227.2	4,984		
1999	45,955	232.1	5,051		
2000	46,276	237.1	5,124		
2001	46,539	241.8	5,195		
2002	46,782	246.4	5,266		
Middle-low alternative projections					
1992	41,578	190.1	4,574	209.0	5,028
1993	42,280	196.2	4,640	223.5	5,290
1994	42,971	203.0	4,723	241.9	5,629
1995	43,749	210.3	4,807	263.1	6,014
1996	44,442	217.4	4,892	285.1	6,416
1997	45,074	224.3	4,975		
1998	45,585	230.3	5,052		
1999	45,955	235.8	5,131		
2000	46,276	241.3	5,214		
2001	46,539	246.6	5,299		
2002	46,782	251.9	5,384		

Table 35.—Current expenditures and current expenditures per pupil in fall enrollment in public elementary and secondary schools, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002—Continued

Year ending	Fall enrollment[1] (in thousands)	Current expenditures			
		Constant 1989–90 dollars[2]		Current dollars[3]	
		Total (in billions)	Per pupil in fall enrollment	Total (in billions)	Per pupil in fall enrollment
		High alternative projections			
1992	41,575	$193.4	$4,653	$211.0	$5,074
1993	42,250	201.3	4,764	227.5	5,386
1994	42,971	210.6	4,902	248.5	5,784
1995	43,749	221.3	5,058	273.4	6,249
1996	44,442	231.1	5,201	298.8	6,723
1997	45,074	240.1	5,328		
1998	45,585	247.0	5,418		
1999	45,955	252.6	5,497		
2000	46,276	258.9	5,596		
2001	46,539	265.0	5,695		
2002	46,782	272.1	5,817		

[1] Each enrollment number is for the fall of the school year ending in the school year shown in column 1. Hence, the enrollment number listed for 1977 is for fall 1976.

[2] Based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor.

[3] Projections in current dollars are not shown after 1996 due to the uncertain behavior of inflation over the long term.

[4] Current expenditures are early estimates.

[5] Estimated on the basis of past data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems, Receipts and Expenditures for Public Elementary and Secondary Education*, *Statistics of Public Elementary and Secondary Schools*, "Selected Public and Private Elementary and Secondary Education Statistics," NCES Bulletin, October 23, 1979, Common Core of Data survey, and "Key Statistics for Public Elementary and Secondary Education: School Year 1990-91," *Early Estimates*, and National Education Association, annual *Estimates of State School Statistics* (Latest edition 1990-91). Copyright 1991 by the National Education Association. All rights reserved. (This table prepared May 1991.)

Table 36.—Average annual salaries of classroom teachers in public elementary and secondary schools, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Constant 1989–90 dollars[1]	Current dollars[2]
1977	$28,895	$13,354
1978	28,800	14,198
1979	27,874	15,032
1980	26,141	15,970
1981	25,875	17,644
1982	26,089	19,274
1983	26,782	20,695
1984	27,373	21,935
1985	28,336	23,600
1986	29,389	25,199
1987	30,308	26,567
1988	30,717	28,029
1989	30,973	29,563
1990	31,331	31,331
1991	31,204	33,015
Middle-high alternative projections		
1992	31,911	35,080
1993	32,515	37,034
1994	33,219	39,586
1995	33,903	42,409
1996	34,585	45,358
1997	35,114	
1998	35,546	
1999	35,819	
2000	36,035	
2001	36,314	
2002	36,675	
Low alternative projections		
1992	31,649	34,553
1993	32,102	36,407
1994	32,687	38,802
1995	33,263	41,496
1996	33,825	44,321
1997	34,211	
1998	34,552	
1999	34,784	
2000	35,002	
2001	35,275	
2002	35,529	
Middle-low alternative projections		
1992	31,670	34,814
1993	32,177	36,649
1994	32,815	39,104
1995	33,449	41,830
1996	34,043	44,647
1997	34,489	
1998	34,875	
1999	35,160	
2000	35,429	
2001	35,767	
2002	36,089	

Table 36.—Average annual salaries of classroom teachers in public elementary and secondary schools, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002—Continued

Year ending	Constant 1989–90 dollars[1]	Current dollars[2]
	High alternative projections	
1992	$32,046	$34,948
1993	32,741	37,016
1994	33,660	39,719
1995	34,629	42,779
1996	35,506	45,897
1997	36,158	.
1998	36,607	.
1999	36,895	.
2000	37,239	.
2001	37,641	.
2002	38,138	.

[1] Based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor.

[2] Projections in current dollars are not shown after 1996 due to the uncertain behavior of inflation over the long term.

SOURCE: National Education Association, annual *Estimates of State School Statistics*. (Latest edition 1990-91. Copyright 1991 by the National Education Association. All rights reserved.) (This table prepared May 1991.)

State-Level Projections

Map of the United States, by region

Chapter 7

Public Elementary and Secondary Enrollment

Public elementary and secondary school enrollment is projected to rise steadily between 1990 and the year 2002, but these increases will vary widely across the Nation. Enrollment will increase most rapidly in the Northeastern and Western regions, where public school enrollment is expected to rise 22 percent and 18 percent, respectively. An increase of 15 percent is projected for the Southern region, while a smaller increase of 7 percent is expected in the Midwestern region. The greatest growth will occur at the secondary level.

Public school enrollment in kindergarten through grade 8 is expected to grow nearly 1 percent annually between 1990 and 2002, resulting in an increase of about 12 percent for the entire period. All of the regions of the country are expected to show increases, ranging from 17 percent in the Northeastern region to about 5 percent in the Midwestern region. Elementary enrollment is projected to grow by 14 percent in the West and by 13 percent in the South. Enrollment increases are expected for most states; 15 states are expected to have elementary enrollment decreases between 1990 and 2002.

While public high school enrollment (grades 9 through 12) declined during the latter half of the 1980s, it is expected to show sizable increases between 1990 and 2002. This expected increase reflects the changes in the high school age group that will occur during the 1990s, rather than shifts in the graduation rate from public high schools. During the 1990s and beyond, the high school enrollment decreases of the 1980s are expected to reverse as larger numbers of students enter the high school grades, but changes in the regions of the country are expected to differ. High school enrollment in the Northeast is expected to rise by 33 percent between 1990 and 2002, while enrollment in the West will rise by 29 percent. Lower increases in public high school enrollment have been projected for the South and Midwest between 1990 and 2002, 21 percent and 11 percent, respectively.

Public School Enrollment

Public elementary and secondary school enrollment is expected to increase between 1990 and the year 2002; growth rates are expected to accelerate to slightly more than 1 percent annually over the projection period. These increases will not be equally distributed among the different regions of the country (tables 37 and 38 and figures 57 and 58). Public school enrollments will increase most rapidly in the Northeastern states, where total enrollment is expected to rise by 22 percent between 1990 and 2002. Enrollment in the Western region is expected to increase by 18 percent. Increases of 15 percent for the South and 7 percent for the Midwest are expected over the projection period.

Unlike the other regions, public school enrollment in the Northeast has been declining in recent years. Enrollment decreased by 2 percent between 1984 and 1990, but the situation is expected to reverse in the 1990s and beyond. By 2002, a total of about 8.8 million students is anticipated for the region, 22 percent more than in 1990. Furthermore, the Northeast region is expected to experience increases in all states. The most notable increases will occur in New Hampshire (46 percent) and New Jersey (40 percent). Increases are also expected in Maine (23 percent), Massachusetts (21 percent) and Vermont (21 percent). Other increases are foreseen for New York (19 percent), Pennsylvania (12 percent), and Rhode Island (15 percent). Over the projection period, the greatest enrollment growth in the Northeast will occur between 1990 and 1996, with enrollment in Massachusetts (14 percent), New Hampshire (28 percent), New Jersey (17 percent), and Vermont (11 percent) rising faster than that in the other states of the region. The growth of enrollment in most states will slow substantially between 1996 and 2002, with Connecticut (6 percent) and Pennsylvania (6 percent) experiencing the smallest growth (figures 59 and 60).

The Midwestern region is projected to grow more slowly than that in the other regions: 7 percent growth is expected between 1990 and 2002. Between 1984 and 1990, enrollment in the Midwest remained relatively unchanged, but that situation is expected to change between 1990 and 1996, when enrollment is projected to increase by 5 percent. Between 1996 and 2002, enrollment is expected to slow to an increase of 1 percent. Between 1990 and 2002, projections for the Midwestern states indicate more moderate changes than in the other regions. The largest increases projected in the region are for Illinois (19 percent) and Missouri (15 percent). Michigan and South Dakota are projected to have the next largest increases, 11 percent and 9 percent, respectively. Significant declines are projected for Iowa (12 percent) and North Dakota (10 percent). Most of the states will

experience their greatest growth between 1990 and 1996 (figures 61 and 62).

Enrollment increases are projected for many of the Southern states between 1990 and 2002. Overall, enrollment is expected to climb by 15 percent or 2 million students in the region, but significant contrasts among the states will be noticeable. The projected enrollment changes vary from an increase of 44 percent in Virginia to a decrease of 17 percent in Oklahoma. Enrollment increases above the National average are anticipated for Delaware (29 percent), District of Columbia (25 percent), Florida (32 percent), Georgia (27 percent), Maryland (38 percent), North Carolina (32 percent) and Virginia (44 percent). Relatively large decreases in enrollment have been projected for Oklahoma (17 percent) and West Virginia (12 percent). While most of the states in the South will experience their greatest growth between 1990 and 1996, District of Columbia and Mississippi are projected to increase their enrollment levels most between 1996 and 2002 (figures 63 and 64).

Many states in the Western region are expected to have relatively large increases in enrollment. Overall, enrollment in the Western states is expected to rise by nearly 1.7 million students between 1990 and 2002. Much of this increase will be in California, which will strongly affect the region's trend because of its size. Enrollment in California is expected to rise about 1.2 million or 24 percent between 1990 and 2002. Large increases are also expected in Alaska (30 percent), Arizona (35 percent), Hawaii (47 percent), and New Mexico (35 percent) over the projection period. Decreases are expected in Idaho (7 percent), Montana (9 percent), Oregon (1 percent), and Wyoming (15 percent). Of the states in which enrollment is projected to increase between 1990 and 2002, most of the states will experience their fastest growth during the 1990-1996 time period and then increase at a slower rate or decline during the 1996-2002 time period (figures 65 and 66).

Elementary Enrollment

Between 1990 and 2002, public elementary school enrollment in kindergarten through grade 8 (K-8) is expected to grow at an average rate of about 1 percent per year, resulting in an increase of about 12 percent for the entire period. Increases in elementary enrollment are expected to occur in most states across the Nation (tables 39 and 40 and figures 67 and 68). Only 15 states are expected to have decreases in enrollment between 1990 and 2002. All of the regions of the country are expected to show increases, ranging from 17 percent in the Northeast to 5 percent in the Midwest. Elementary enrollment is projected to grow about 14 percent in the West and by 13 percent in the South. These expected increases in elementary enrollment are a reflection of immigration and the rising number of births beginning in 1977, rather than changes in the attendance rates of young children. The NCES projections do not account for enrollment increases that may be caused by changing state and local policies about the provision of prekindergarten and kindergarten programs. Expansion of these programs would lead to higher enrollments at the elementary school level.

Elementary enrollment is expected to show an increase of 17 percent in the Northeast between 1990 and 2002. Unlike the other regions, all states in the Northeast are expected to show increases. Sizable increases are projected for Connecticut (19 percent), Maine (23 percent), Massachusetts (18 percent), New Hampshire (38 percent), and New Jersey (37 percent). Smaller increases are expected in New York (11 percent), Pennsylvania (9 percent), Rhode Island (14 percent), and Vermont (15 percent). Across all states, enrollment increases between 1990 and 1996 are significantly larger than those projected between 1996 and 2002 (figures 69 and 70).

A more modest increase in elementary enrollment has been projected for the Midwestern region. Between 1990 and 2002, enrollment in the Midwest is projected to increase by 5 percent. Increases are expected in Illinois (18 percent), Michigan (10 percent), and Missouri (11 percent). Five states are projected to show decreases. These will occur in Iowa (14 percent), Kansas (1 percent), Nebraska (9 percent), North Dakota (19 percent), and Wisconsin (4 percent). Half of the states will experience their greatest growth between 1990 and 1996 (figures 71 and 72).

A relatively large increase of more than 1 million students is expected for the Southern region between 1990 and 2002, resulting in a 13-percent increase between 1990 and 2002. Between 1990 and 2002, the largest increases are expected in Delaware (27 percent), Florida (30 percent), Georgia (27 percent), Maryland (32 percent), North Carolina (30 percent), and Virginia (42 percent). Slight declines have been projected for Kentucky (2 percent) and Texas (3 percent). Sizable decreases are projected for Oklahoma (23 percent) and West Virginia (11 percent). While most of the states are projected to experience faster growth rates between 1990 and 1996, Mississippi and Tennessee will show greater enrollment increases between 1996 and 2002 (figures 73 and 74).

Elementary enrollment (K-8) in the Western states is expected to rise between 1990 and 2002, an increase of 14 percent. This amounts to an increase of about 1 million students, more than four-fifths of which will be in California. Over the projection period, particularly large enrollment increases are anticipated for Alaska (22 percent), Arizona (23 percent), California (21 percent), Hawaii (27 percent), and New Mexico (18 percent). In contrast to the rest of the region, significant enrollment decreases are anticipated for Montana (14 percent) and Wyoming (19 percent). Most of the states will experience their greatest growth between 1990 and 1996 (figures 75 and 76).

High School Enrollment

Between 1990 and 2002, enrollment in public high schools (grades 9 through 12) is expected to increase by 23 percent, reversing its decline during the 1980s. Over the projection period, enrollment increases are projected in all of the regions (tables 41 and 42 and figures 77 and 78). The Northeast is projected to increase by 33 percent and the West by 29 percent. Enrollment in the South and Midwest are projected to increase by 21 percent and 11 percent, respectively.

Between 1984 and 1990, high school enrollment in the Northeast declined by 19 percent. Over the projection period, it will increase by 12 percent between 1990 and 1996, and then increase another 19 percent between 1996 and 2002. Between 1990 and 2002, increases are projected in all states in the Northeast, reversing declines in these states during the late 1980s. Projected changes in state enrollments range from an increase of 15 percent in Connecticut to 69 percent in New Hampshire. Other increases are expected in Maine (23 percent), Massachusetts (28 percent), New Jersey (48 percent), New York (40 percent), and Vermont (37 percent). Unlike the states in the other regions, most of the states in the Northeast will experience their greatest growth during the latter half of the projection period (figures 79 and 80).

The Midwestern region is expected to show an increase of 11 percent in high school enrollment between 1990 and 2002. Increases are projected for most of the states, reversing the declines that occurred in the late 1980s. Sizable increases are expected in Illinois (24 percent), Missouri (26 percent), and South Dakota (29 percent). Iowa is expected to decrease by 7 percent and Nebraska is projected to decline by 5 percent over the projection period. During the projection period, all of the states are projected to increase between 1990 and 1996. In contrast, high school enrollment in most of the states is expected to decrease between 1996 and 2002 (figures 81 and 82).

Between 1990 and 2002, public high school enrollment in the South is projected to increase by 21 percent. This increase will reverse the declines of the late 1980s. Over the projection period, increases are expected in Delaware (35 percent), District of Columbia (99 percent), Florida (37 percent), Georgia (28 percent), Louisiana (24 percent), Maryland (58 percent), North Carolina (38 percent), and Virginia (50 percent). Kentucky, Oklahoma, and West Virginia are expected to have declines in high school enrollment over the projection period. During the first half of the projection period (1990 to 1996), all states in the region except West Virginia are projected to reverse their enrollment declines from the late 1980s. Between 1996 and 2002, this growth will continue for most states (figures 83 and 84).

The Western region's high school enrollment is expected to rise about 724,000 between 1990 and 2002. Most of the increase (23 percent) is expected to occur between 1990 and 1996. This marks a significant increase over the 1-percent growth that occurred between 1984 and 1990. Between 19[illegible] and 2002, particularly large increases have been projected for Alaska (50 percent), Arizona (83 percent), California (30 percent), Colorado (28 percent), Hawaii (102 percent), and New Mexico (75 percent). Idaho, Oregon, and Wyoming are the only states in the region for which a decline has been projected. Most of the states in the West will experience their greatest growth between 1990 and 1996 (figure 85 and 86).

Figure 57

Enrollment in grades K-12 in public schools, by region, with projections: Fall 1982 to fall 2002

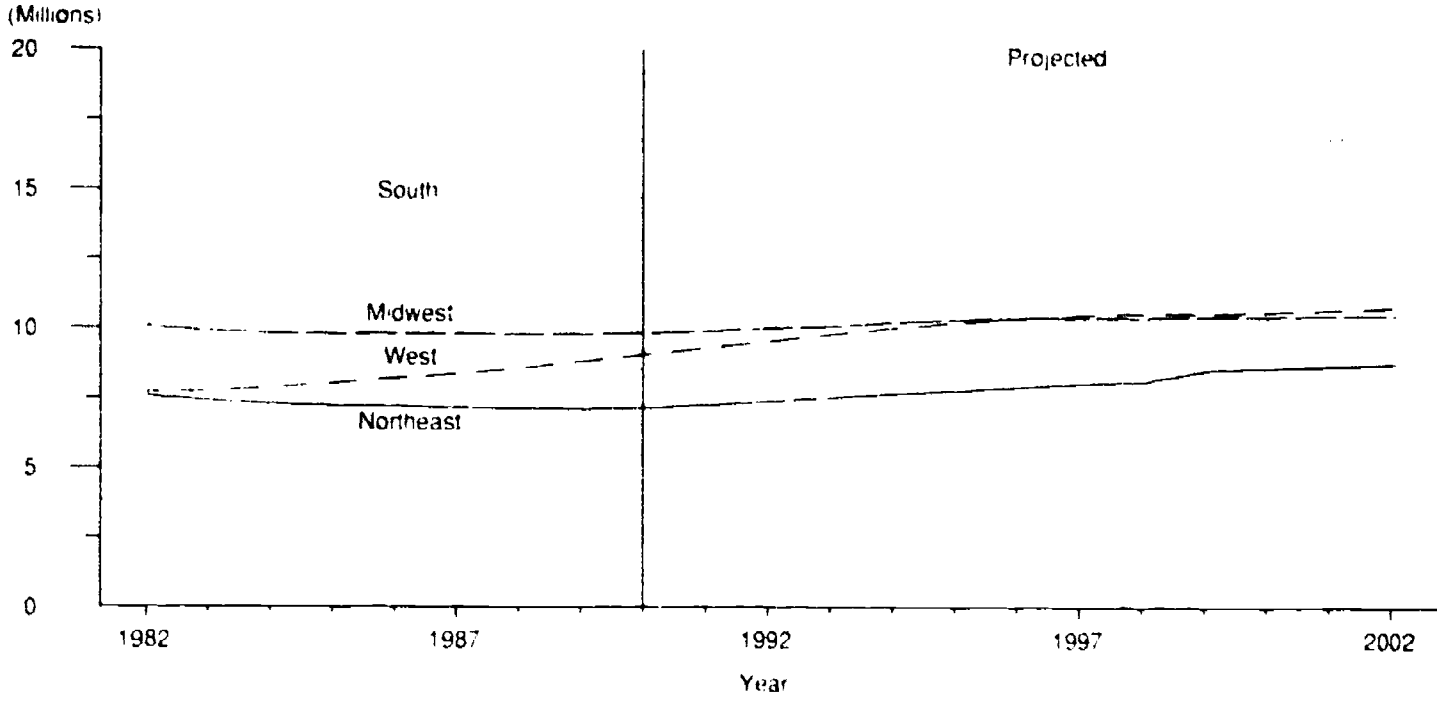


Figure 58

Percent change in grades K-12 enrollment in public schools, by state: Fall 1990 to fall 2002

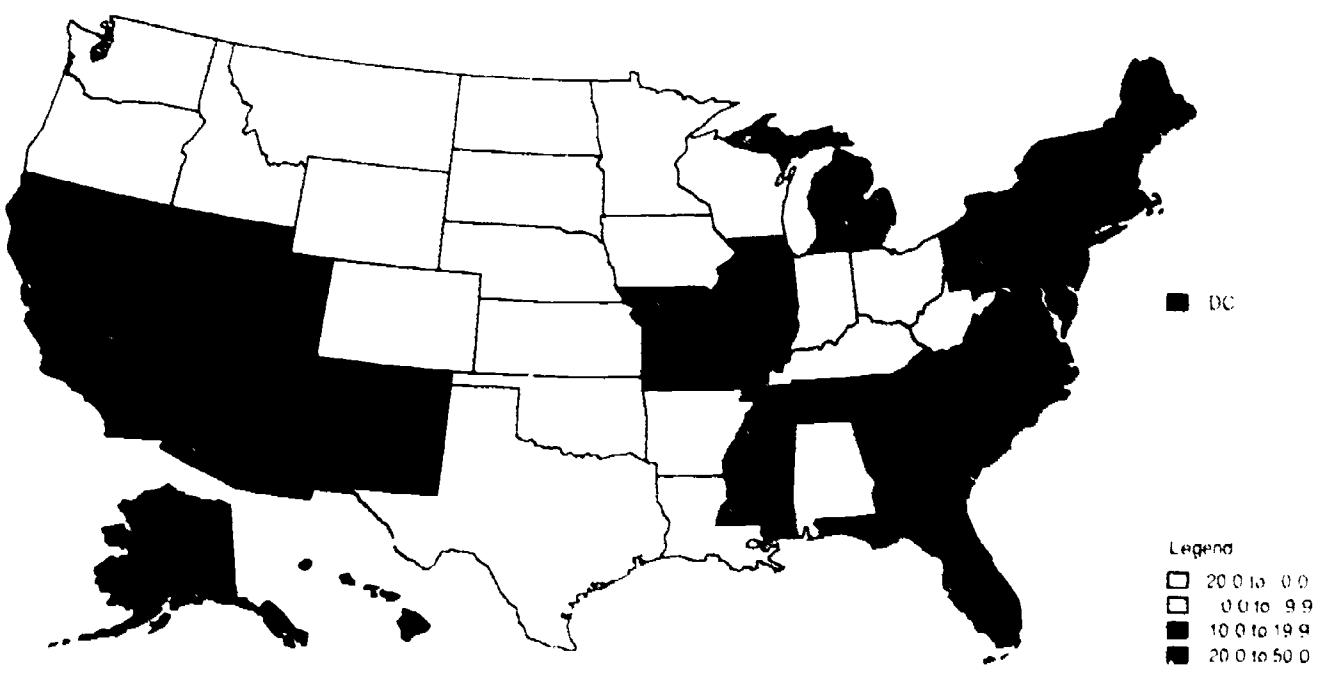


Figure 59

Percent change in public K-12 enrollment, by state: Northeast, 1990 to 1996

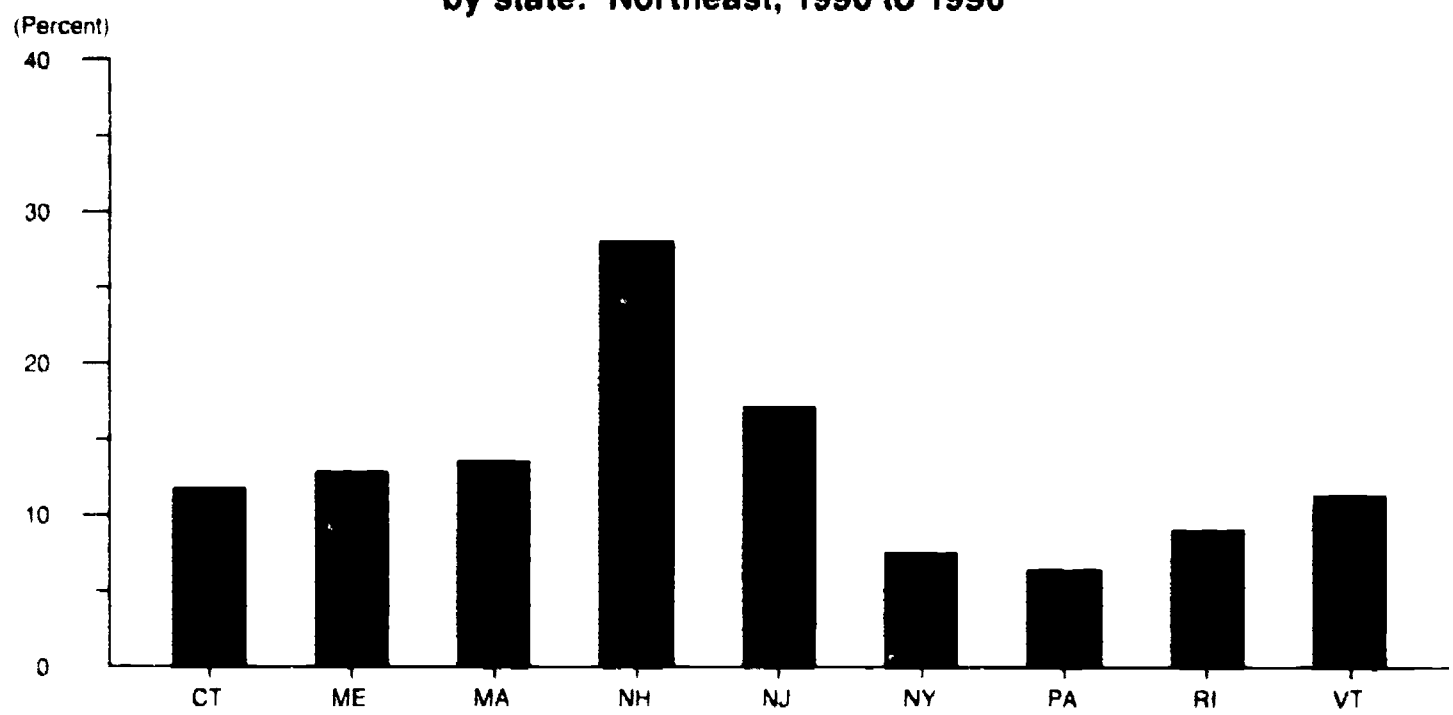


Figure 60

Percent change in public K-12 enrollment, by state: Northeast, 1996 to 2002

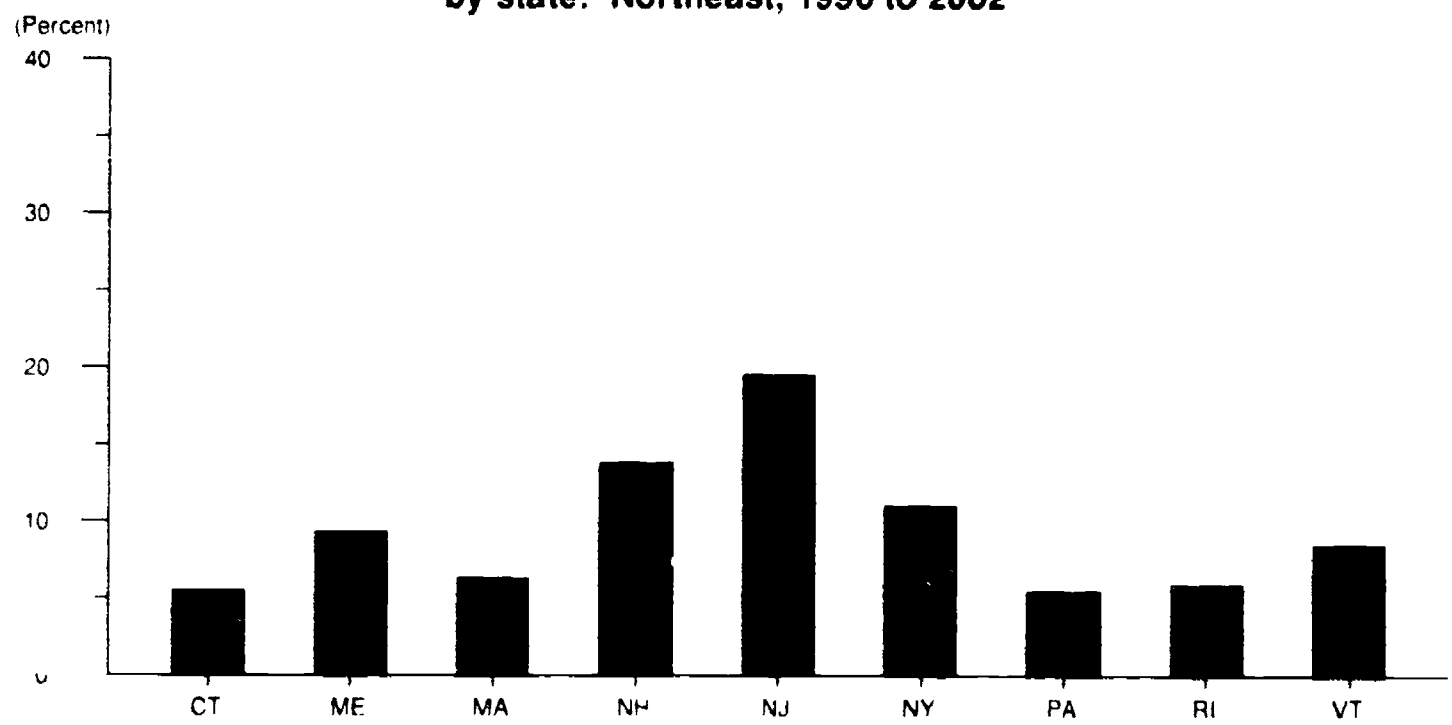


Figure 61

Percent change in public K-12 enrollment, by state: Midwest, 1990 to 1996

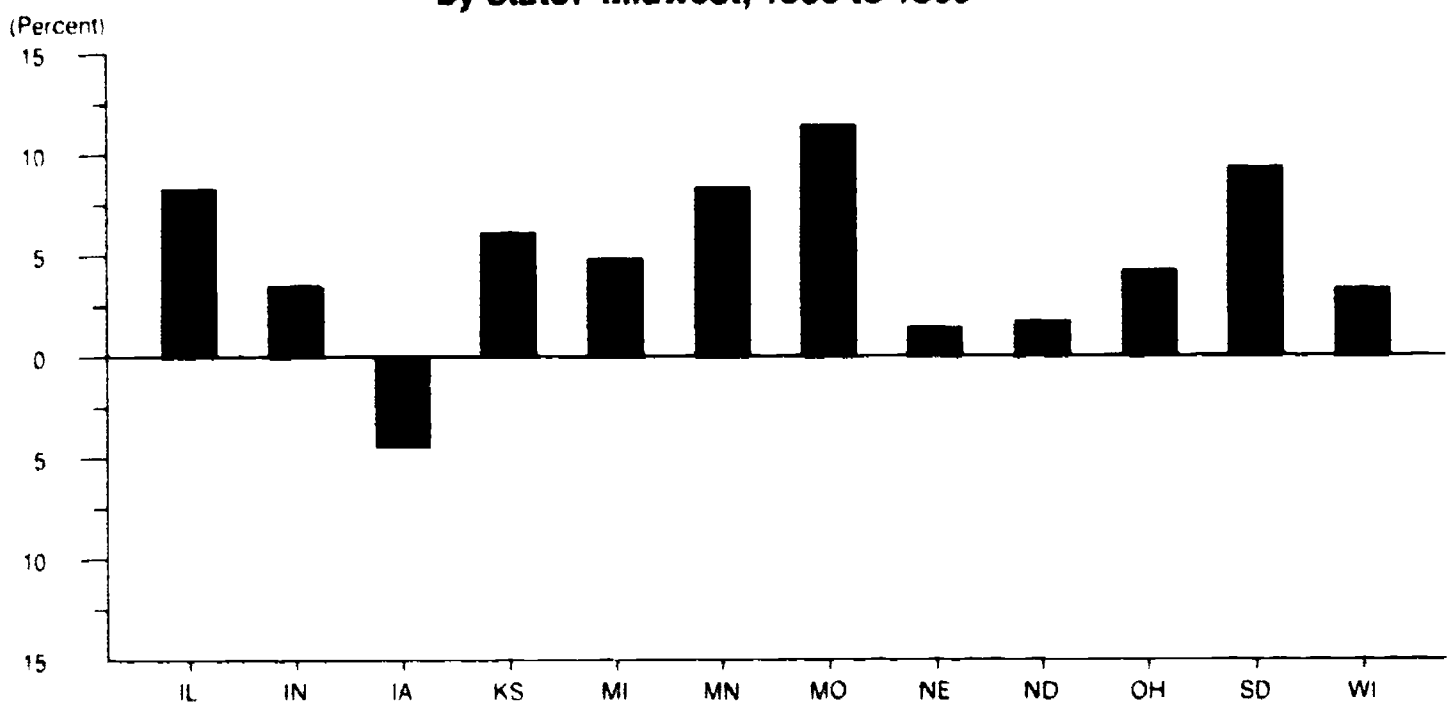


Figure 62

Percent change in public K-12 enrollment, by state: Midwest, 1996 to 2002

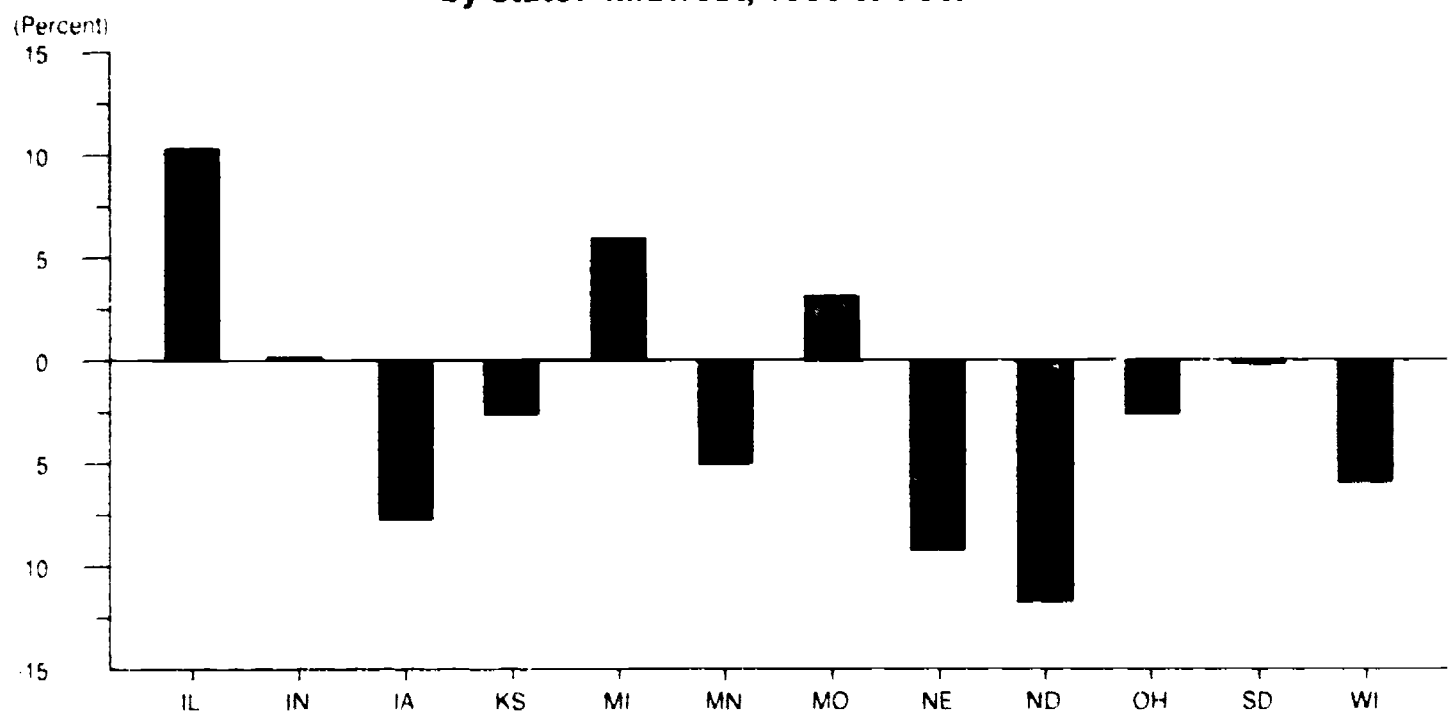


Figure 63

Percent change in public K-12 enrollment, by state: South, 1990 to 1996

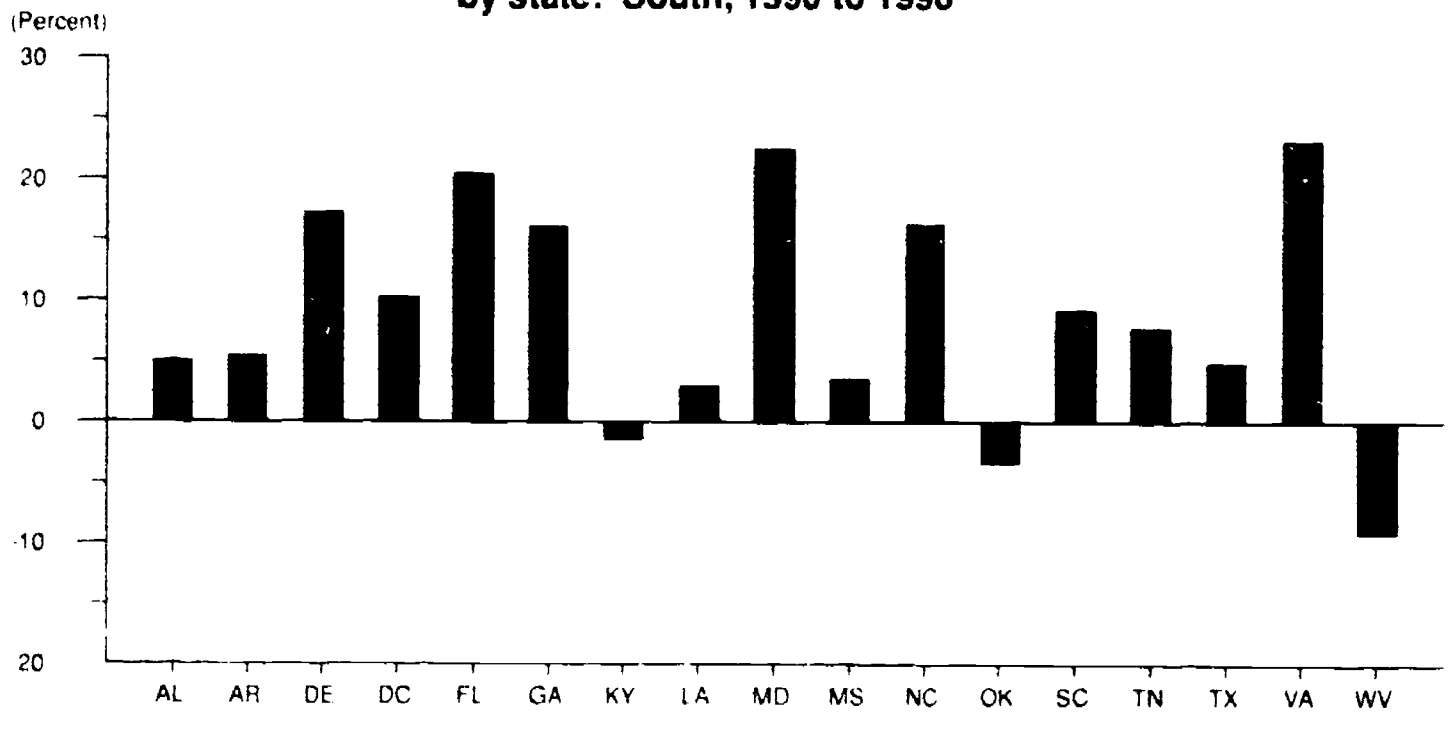


Figure 64

Percent change in public K-12 enrollment, by state: South, 1996 to 2002

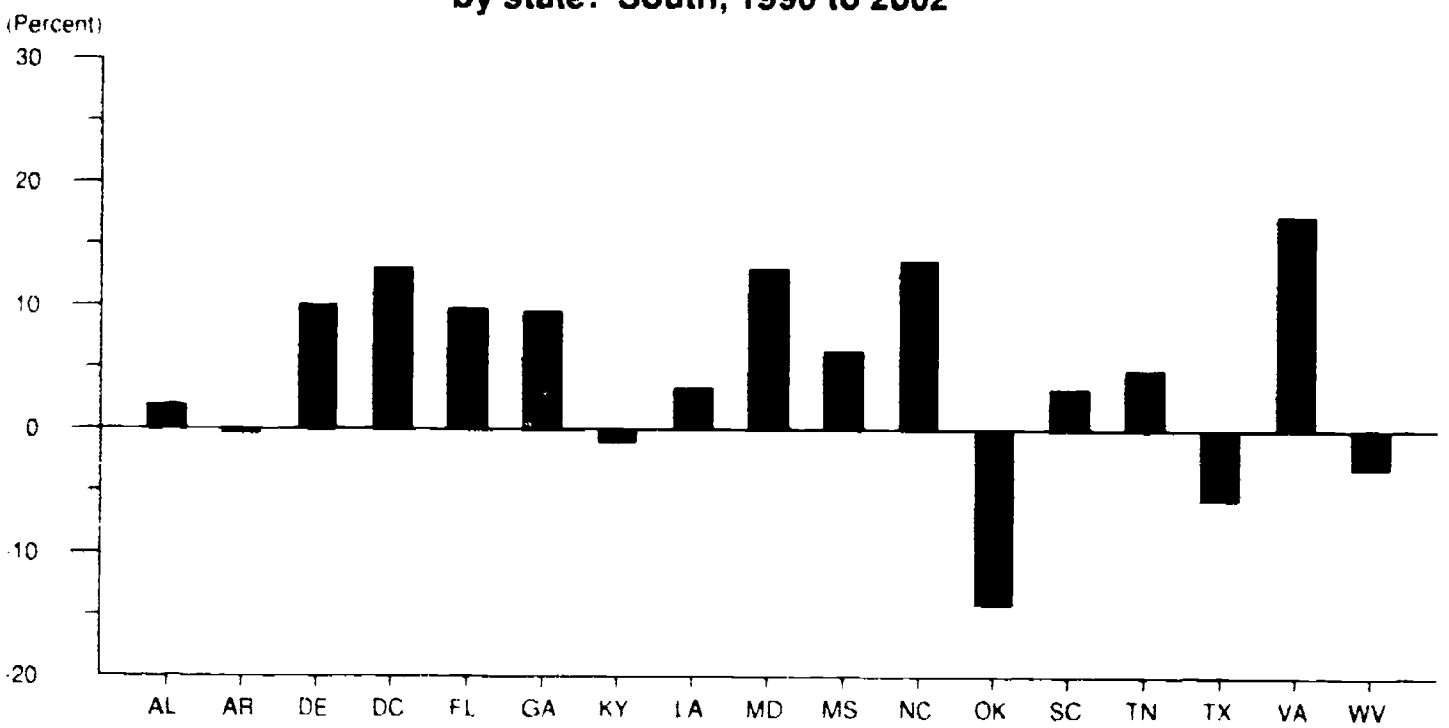


Figure 65

Percent change in public K-12 enrollment, by state: West, 1990 to 1996

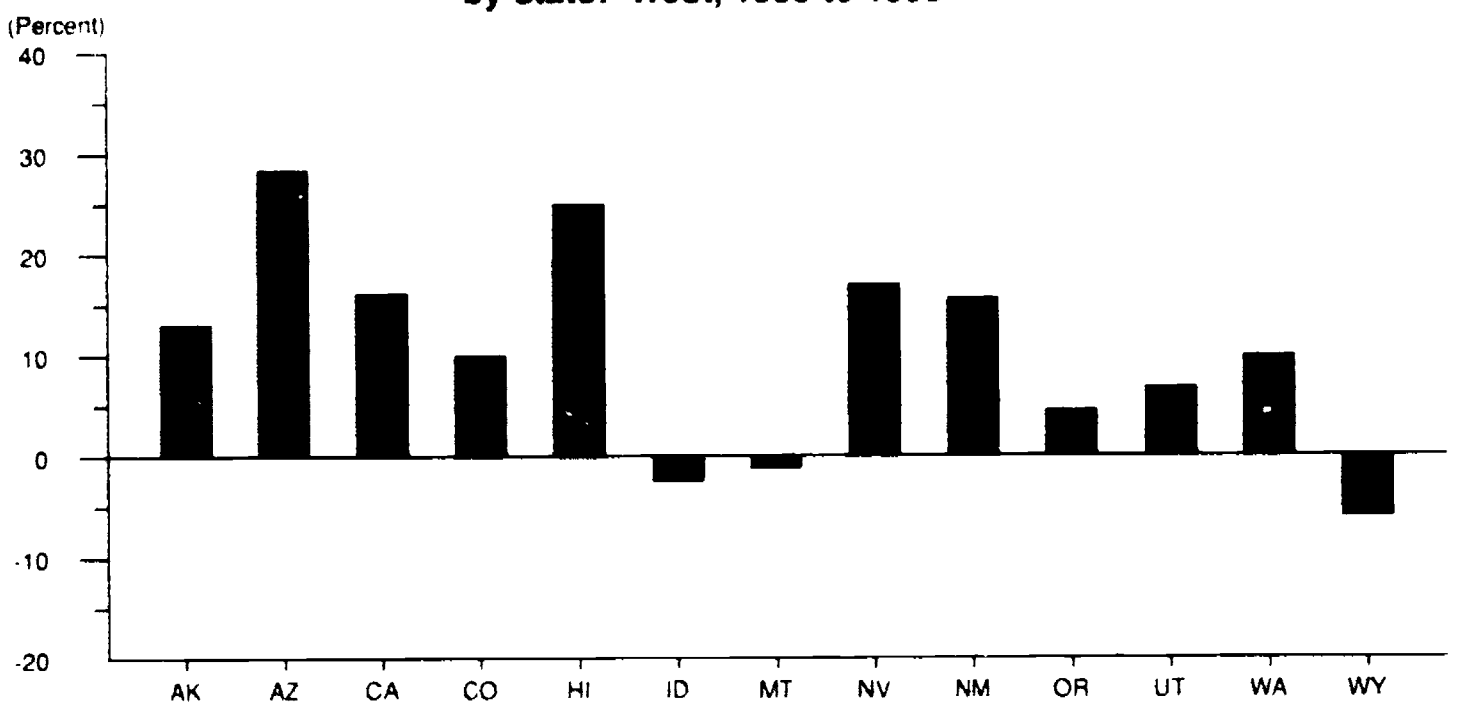


Figure 66

Percent change in public K-12 enrollment, by state: West, 1996 to 2002

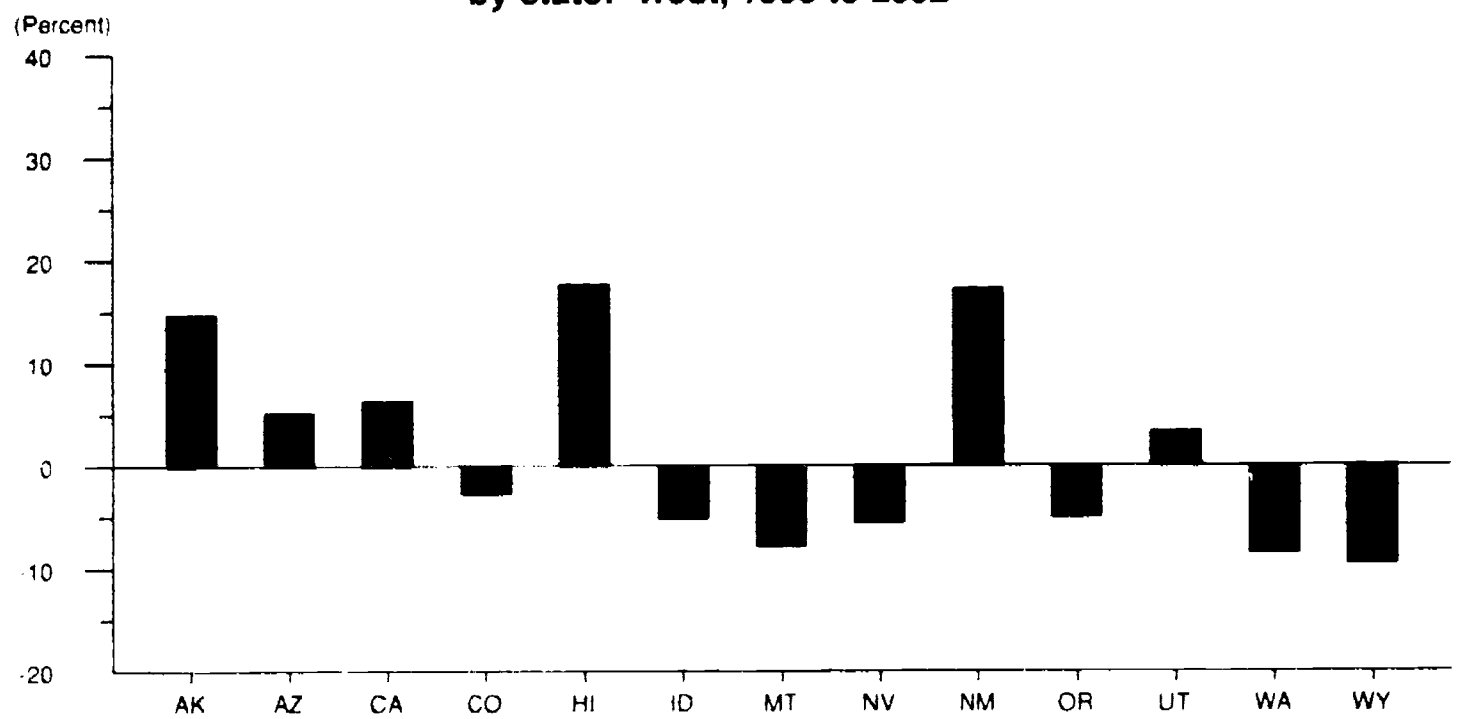


Figure 67

Enrollment in grades K-8 in public schools, by region, with projections: Fall 1982 to fall 2002

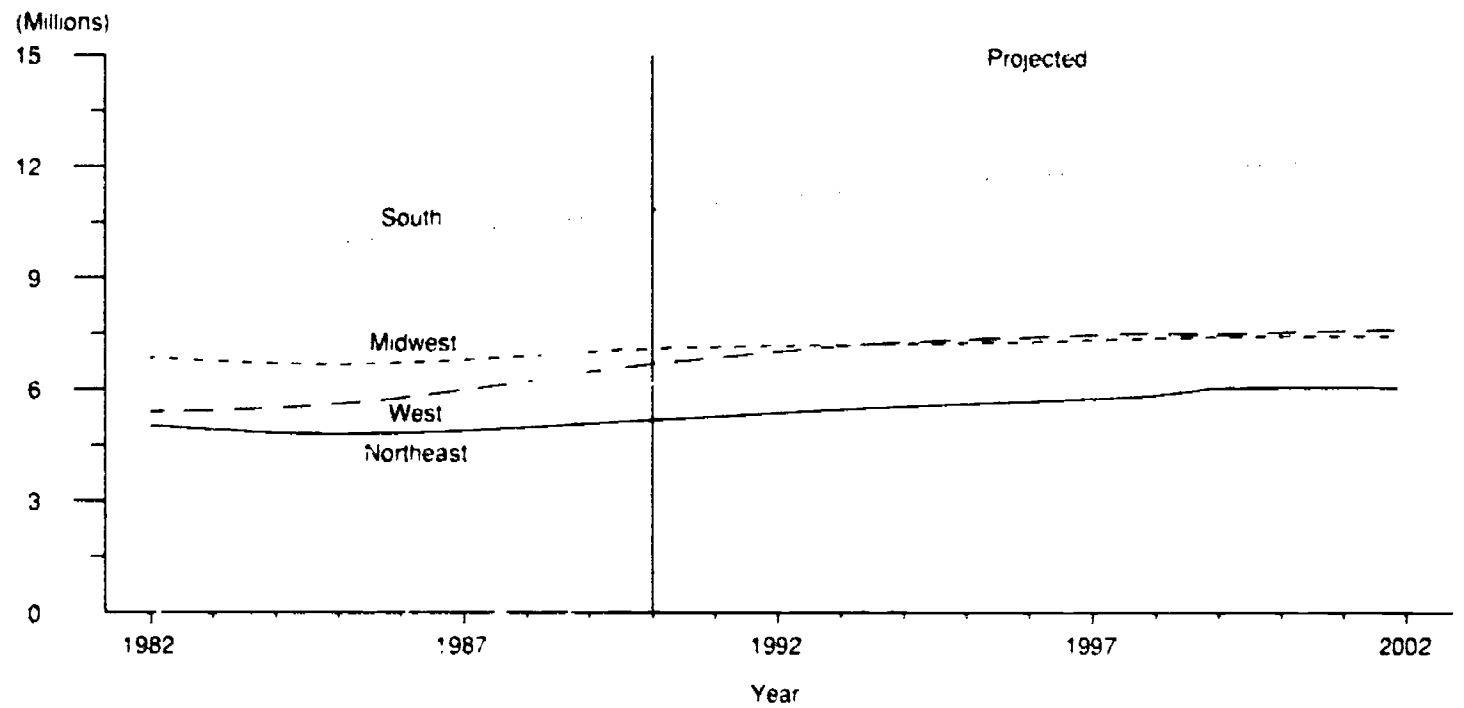


Figure 68

Percent change in grades K-8 enrollment in public schools, by state: Fall 1990 to fall 2002

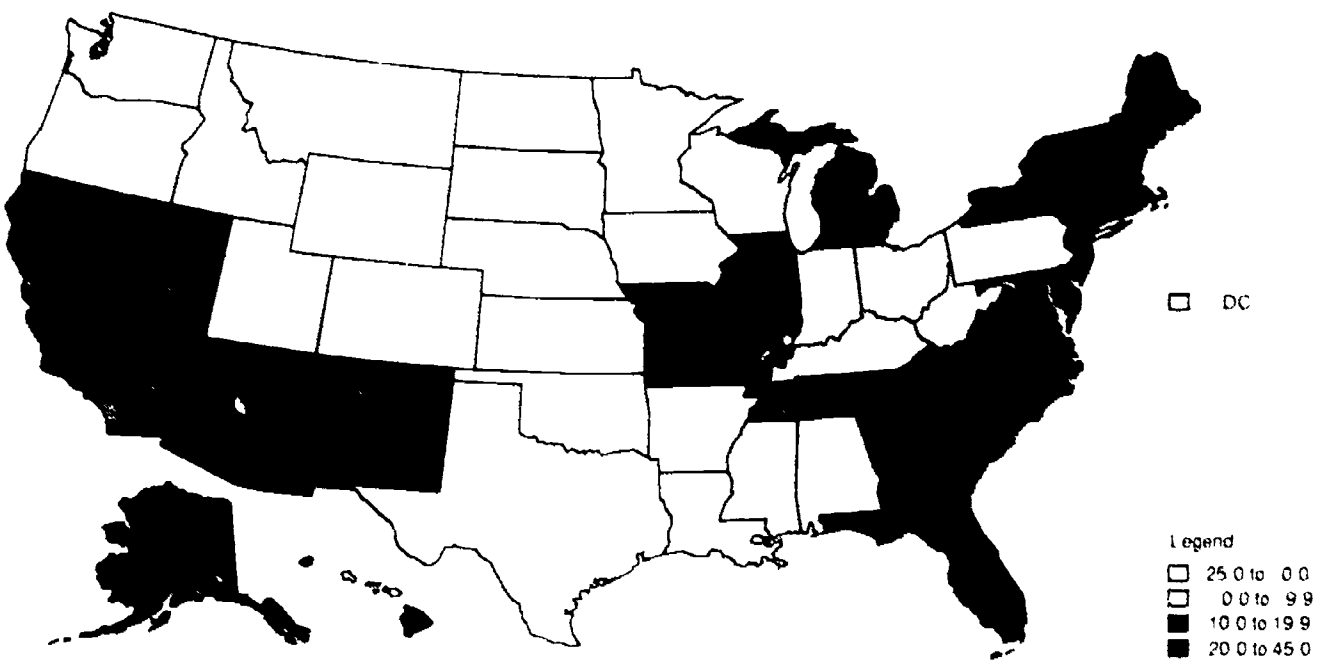


Figure 69

Percent change in public K-8 enrollment, by state: Northeast, 1990 to 1996

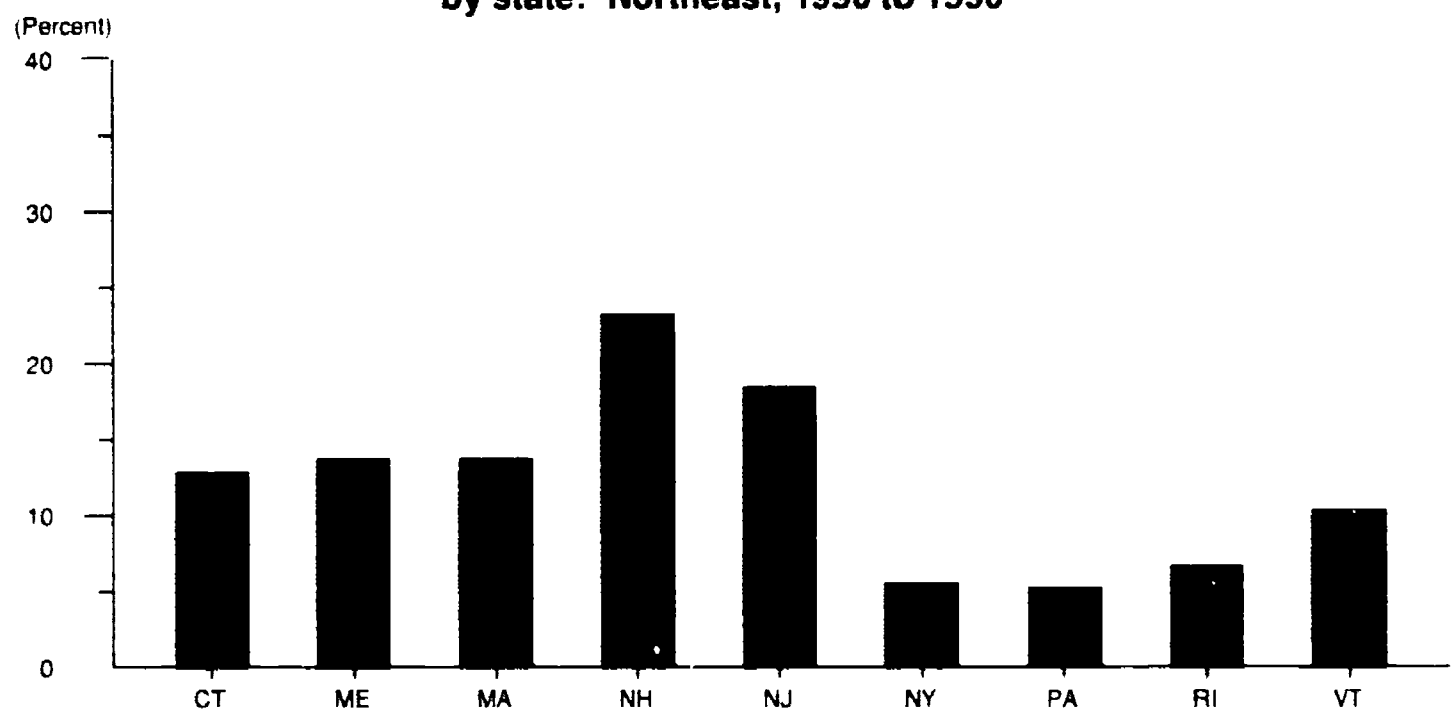


Figure 70

Percent change in public K-8 enrollment, by state: Northeast, 1996 to 2002

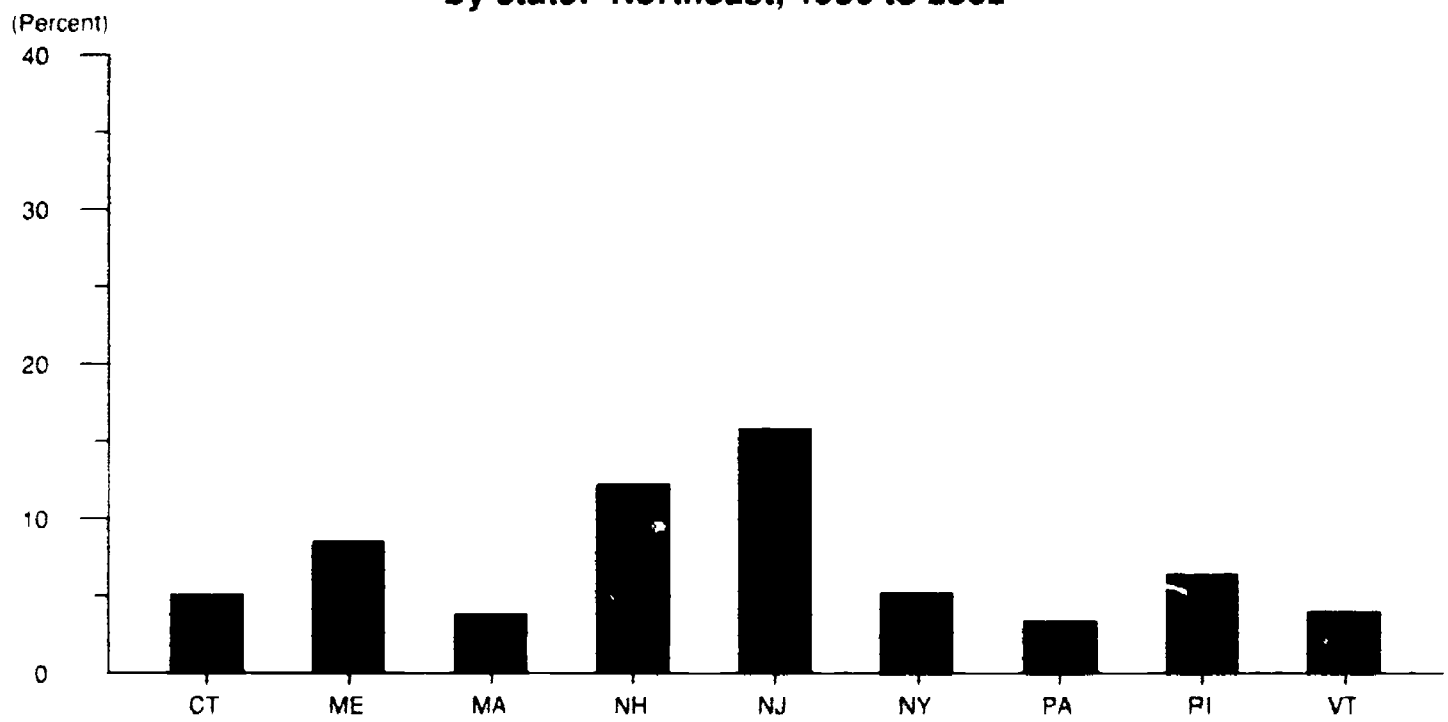


Figure 71

Percent change in public K-8 enrollment, by state: Midwest, 1990 to 1996

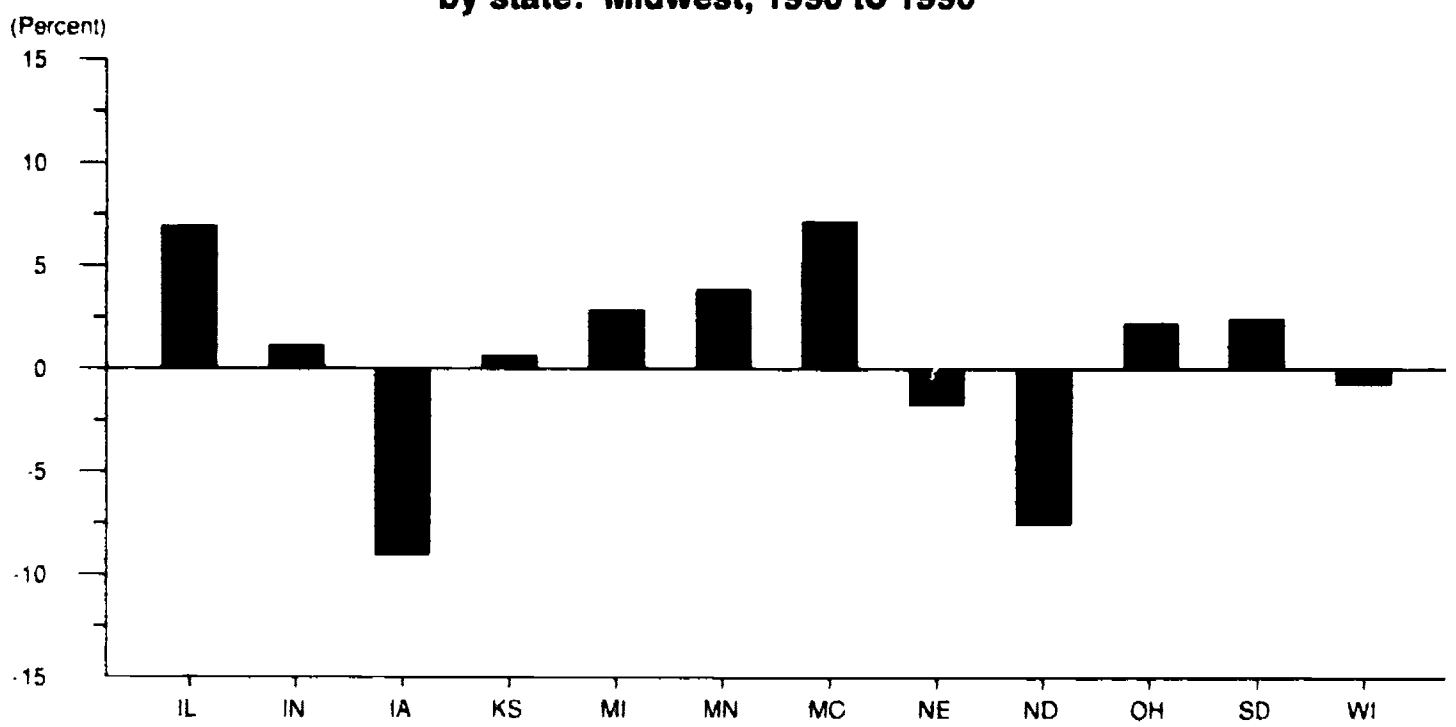


Figure 72

Percent change in public K-8 enrollment, by state: Midwest, 1996 to 2002

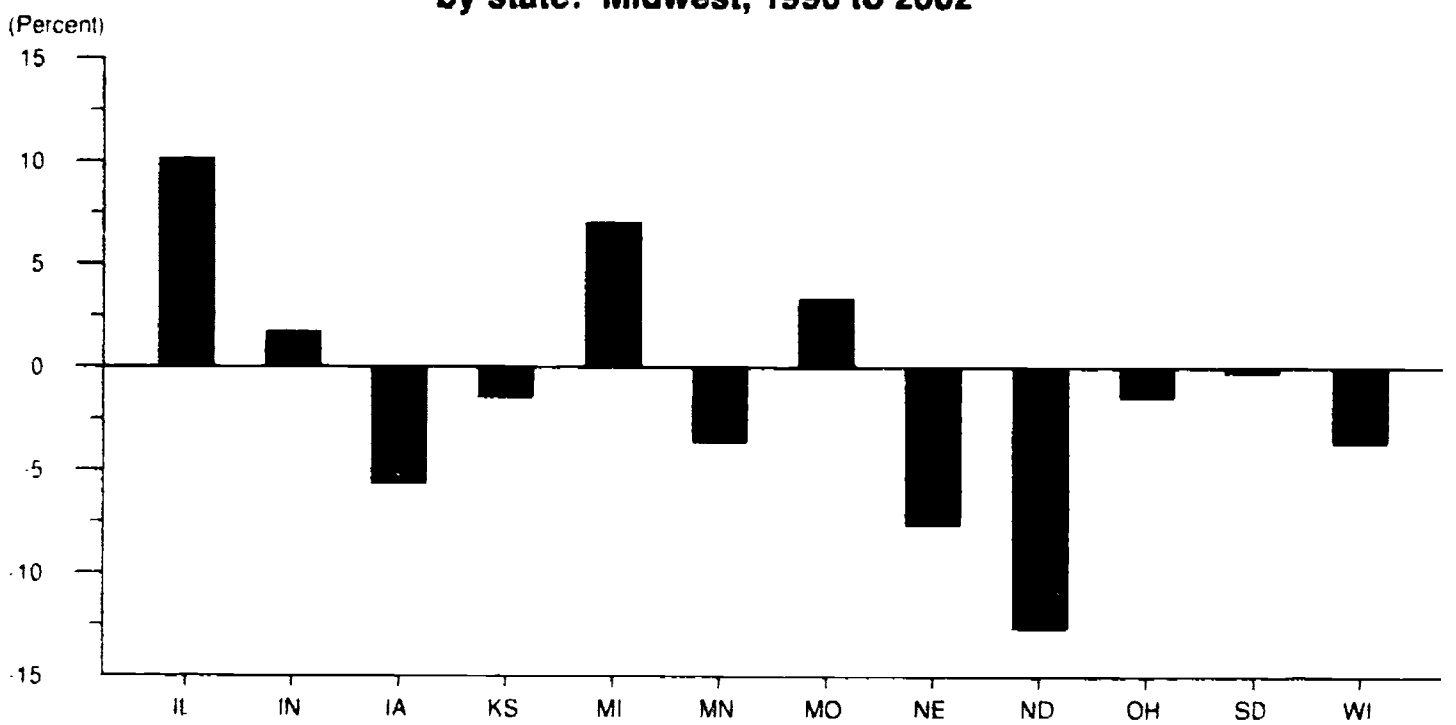


Figure 73

Percent change in public K-8 enrollment, by state: South, 1990 to 1996

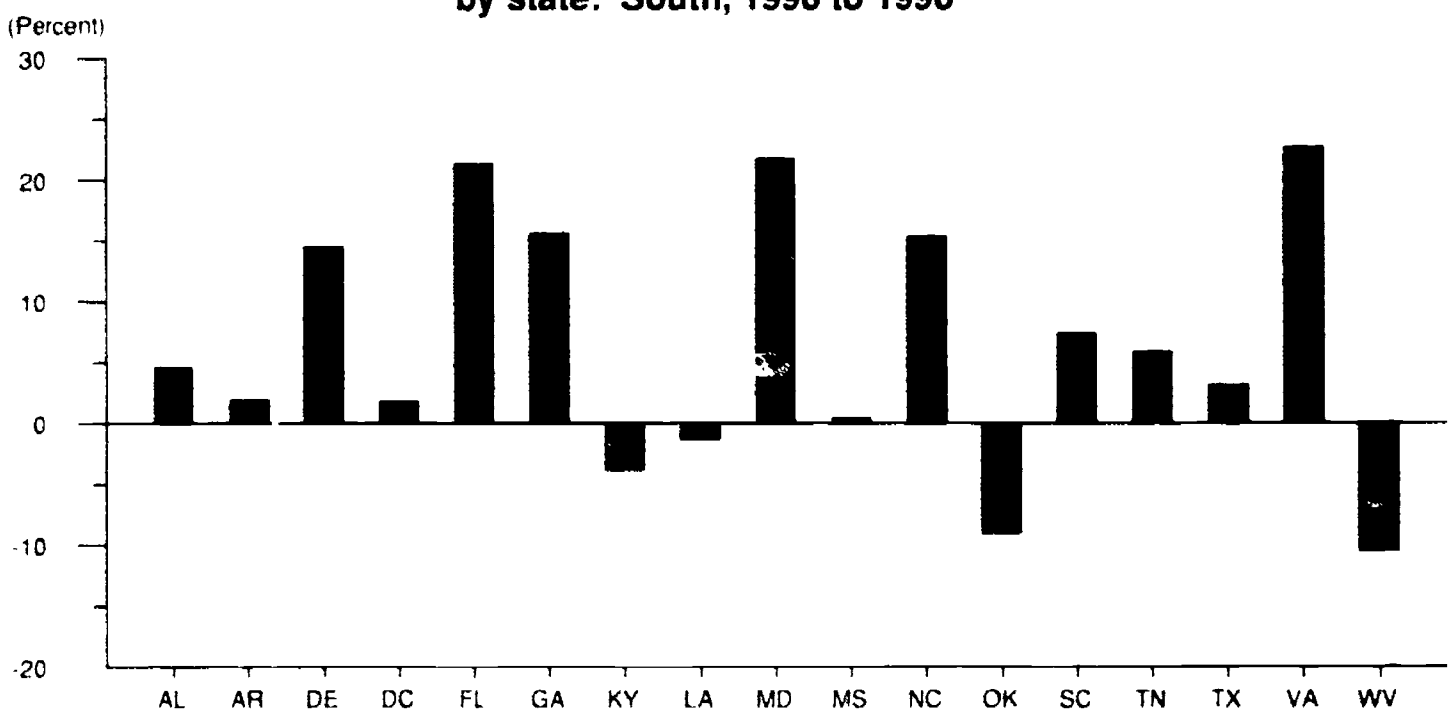


Figure 74

Percent change in public K-8 enrollment, by state: South, 1996 to 2002

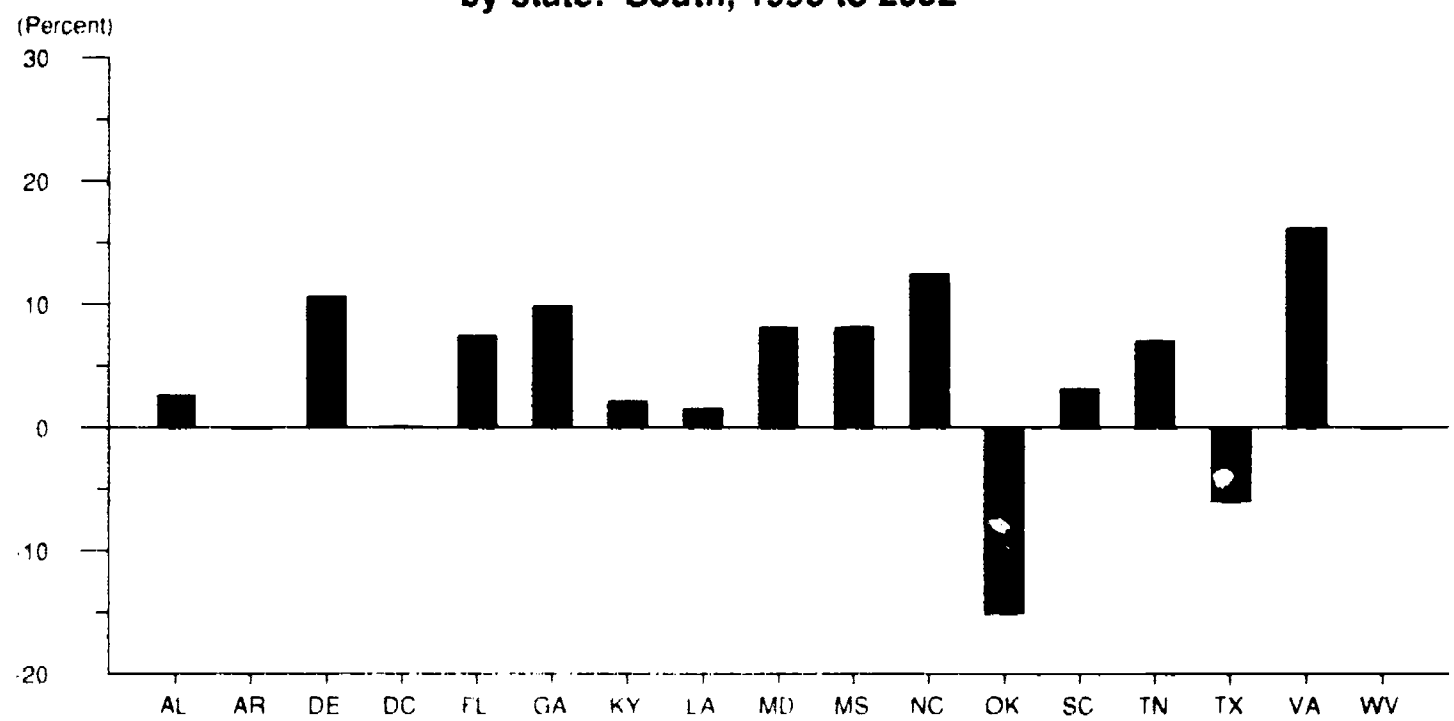


Figure 75

Percent change in public K-8 enrollment, by state: West, 1990 to 1996

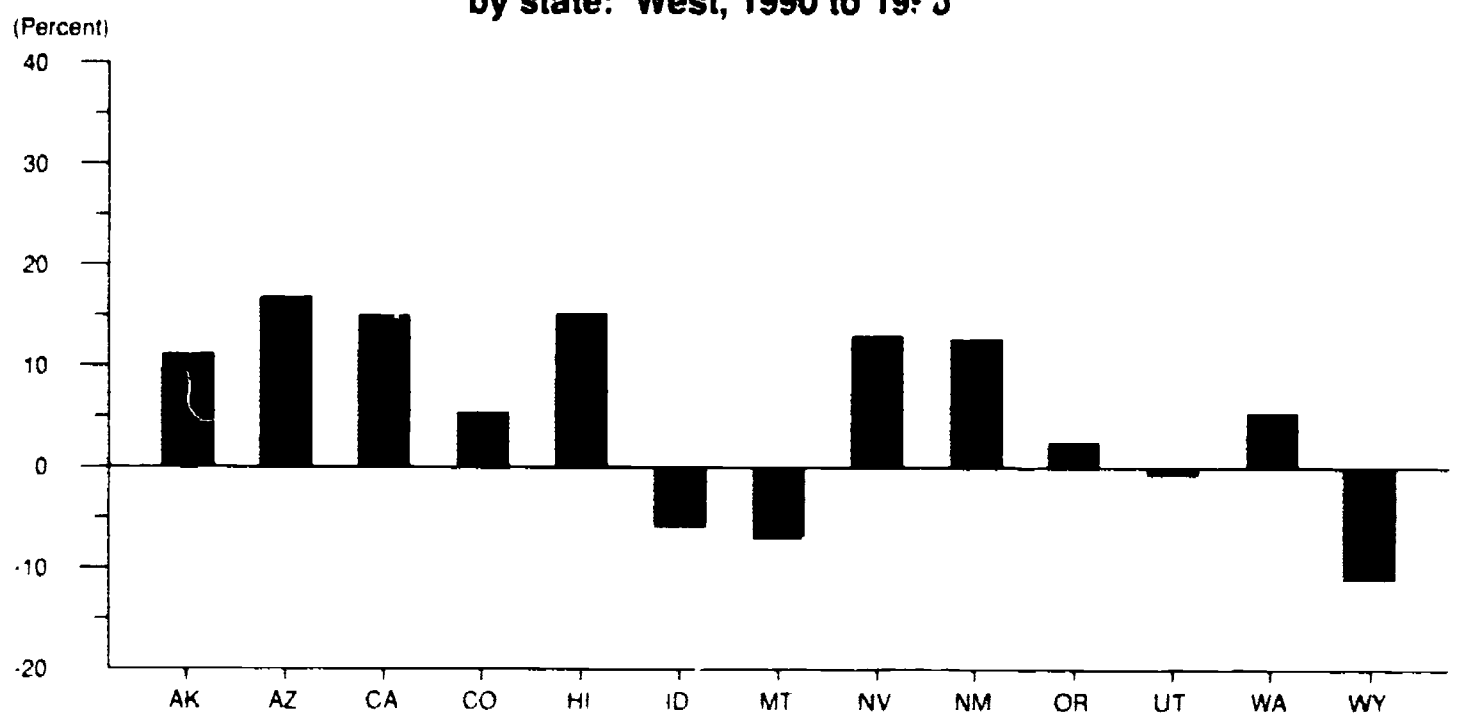


Figure 76

Percent change in public K-8 enrollment, by state: West, 1996 to 2002

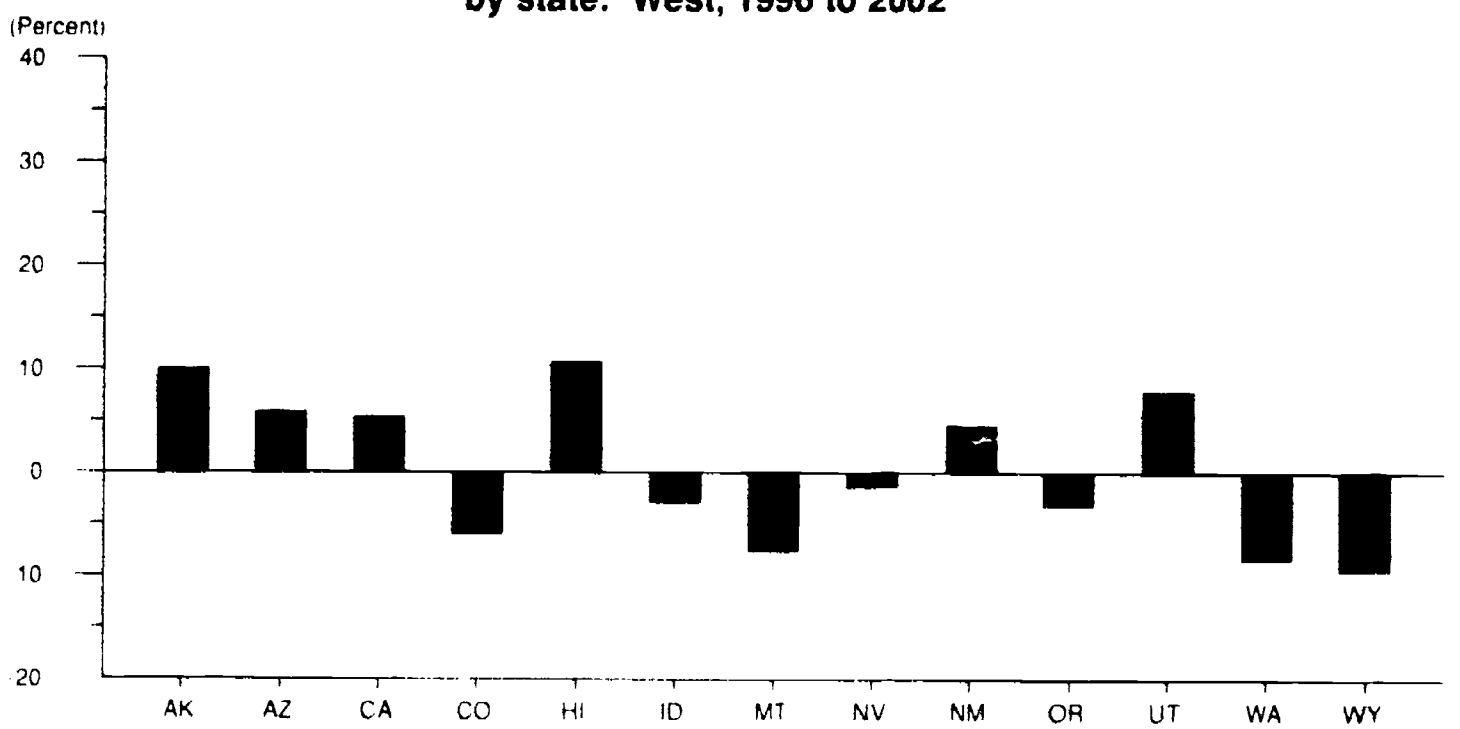


Figure 77

Enrollment in grades 9-12 in public schools, by region, with projections: Fall 1982 to fall 2002

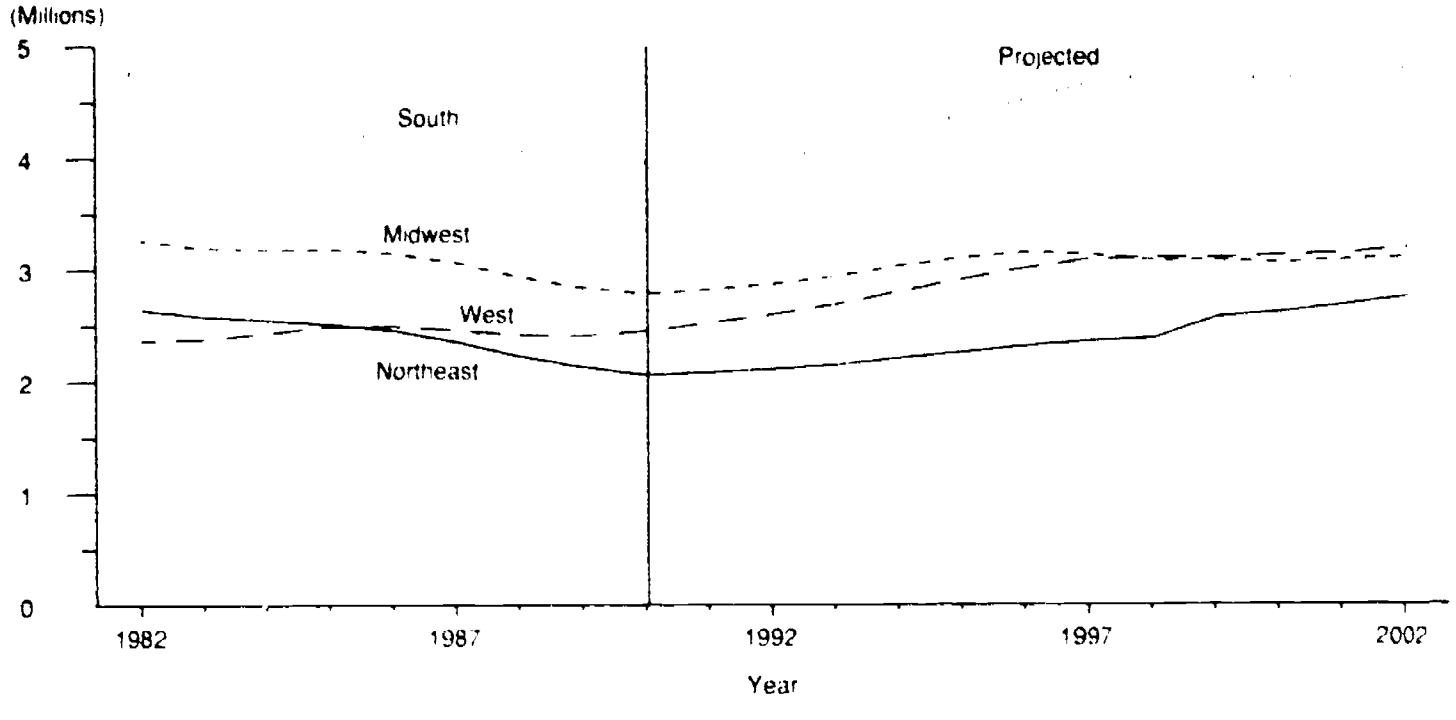


Figure 78

Percent change in grades 9-12 enrollment in public schools, by state: Fall 1990 to fall 2002

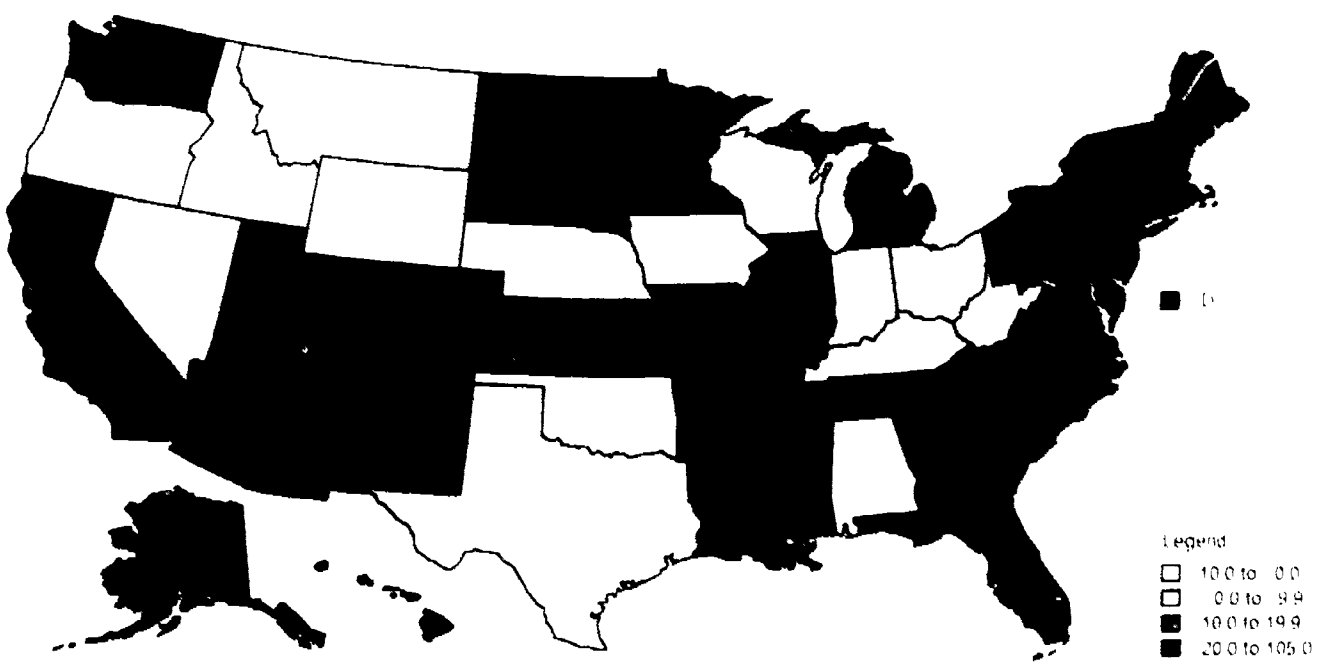


Figure 79

Percent change in public 9-12 enrollment, by state: Northeast, 1990 to 1996

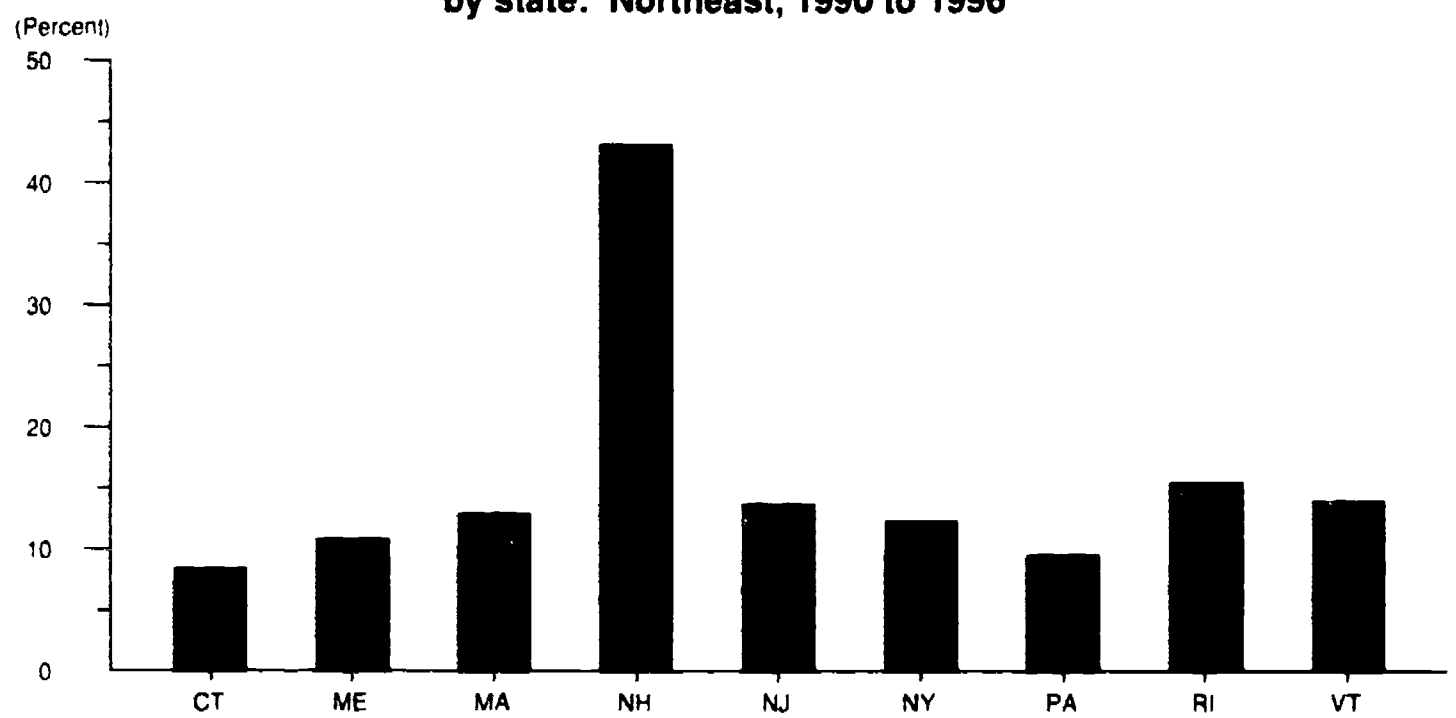


Figure 80

Percent change in public 9-12 enrollment, by state: Northeast, 1996 to 2002

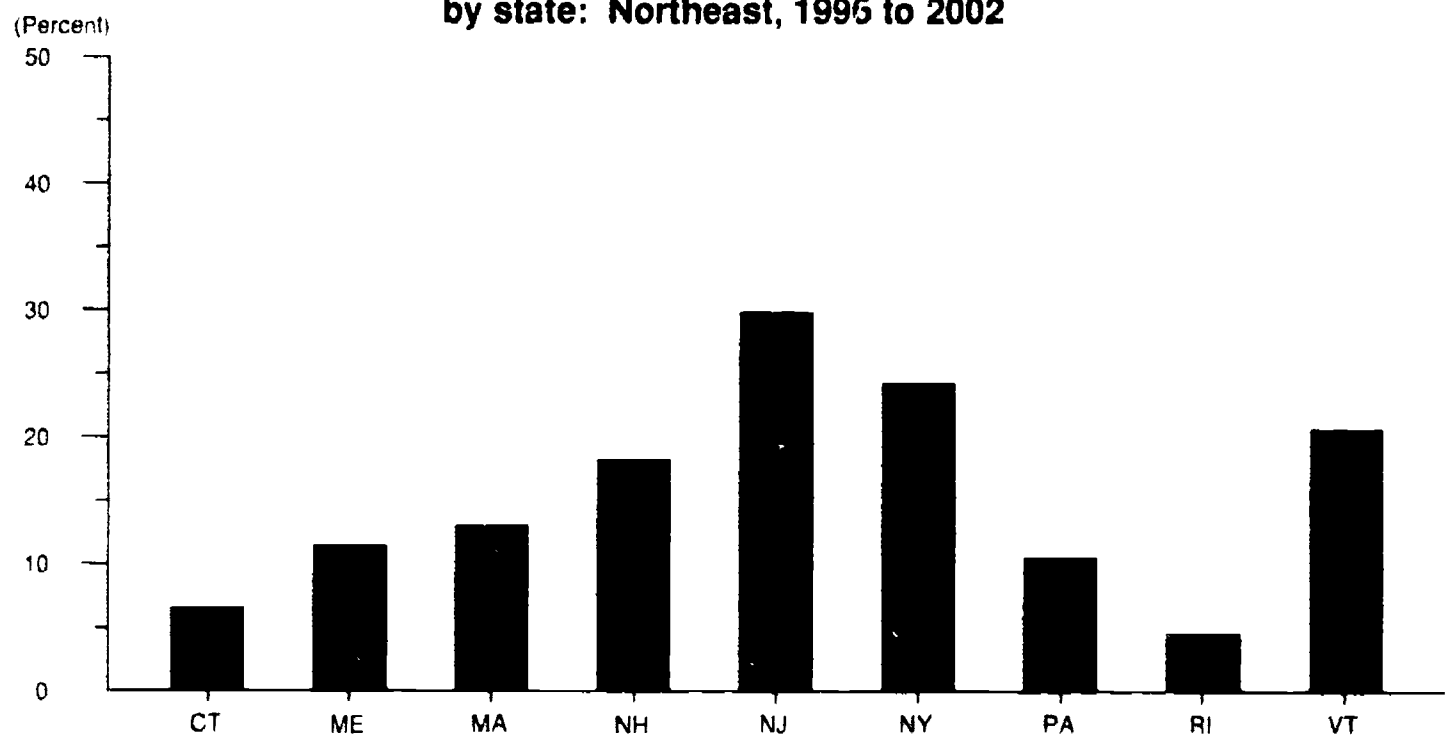


Figure 81

Percent change in public 9-12 enrollment, by state: Midwest, 1990 to 1996

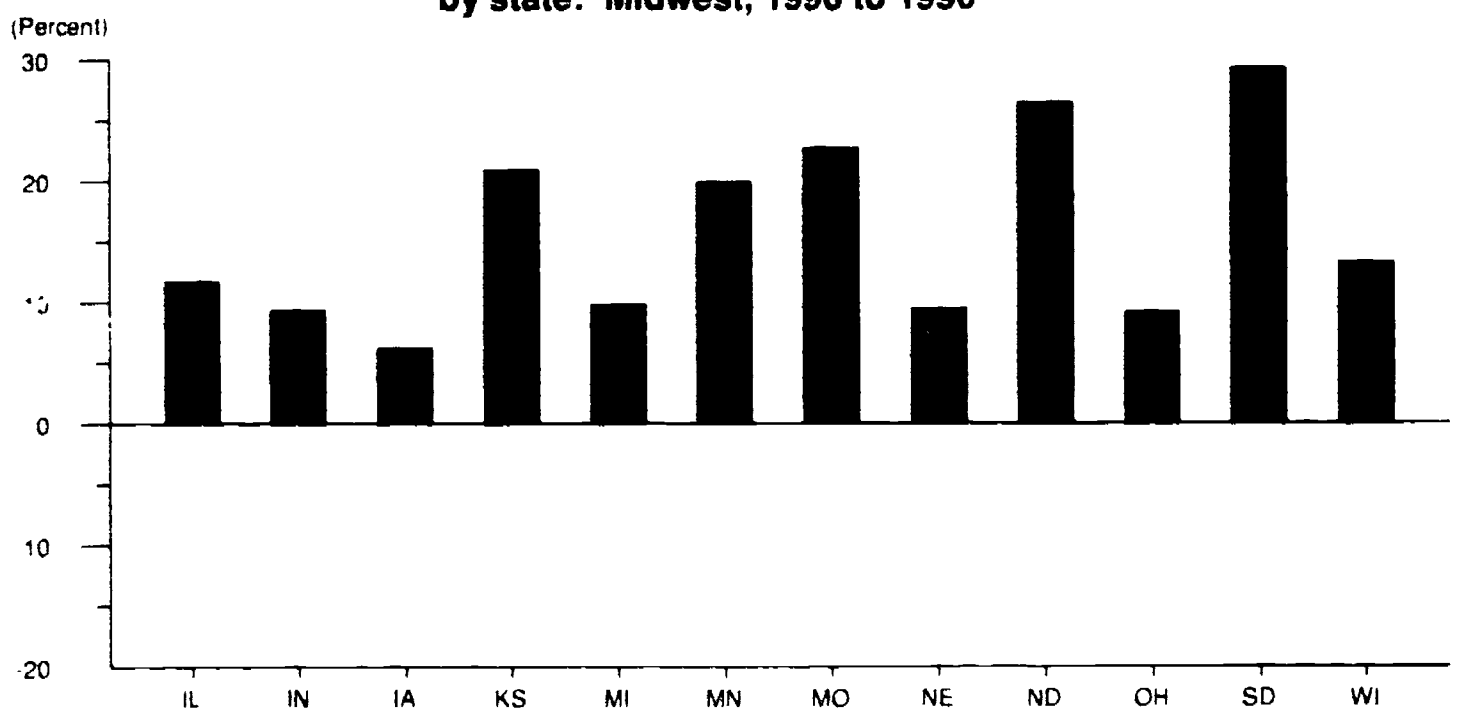


Figure 82

Percent change in public 9-12 enrollment, by state: Midwest, 1996 to 2002

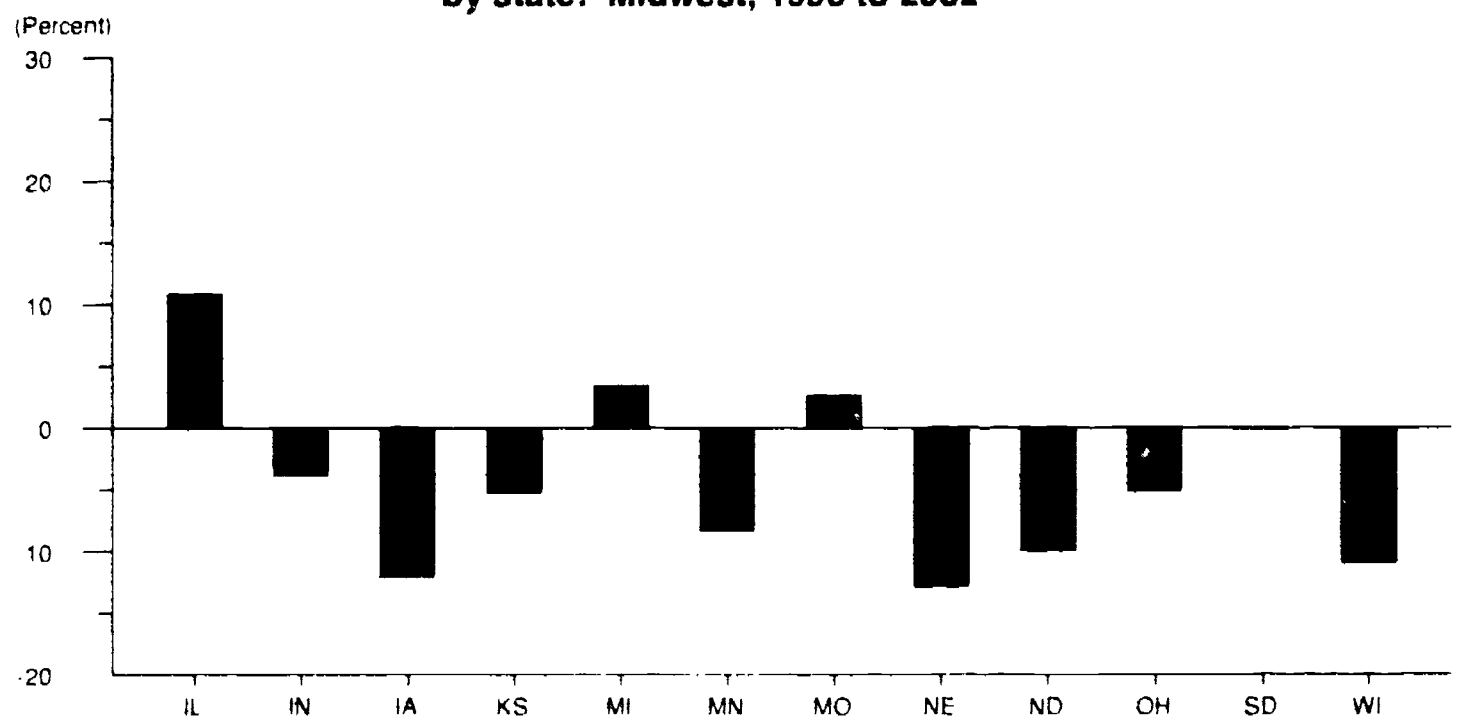


Figure 83

Percent change in public 9-12 enrollment, by state: South, 1990 to 1996

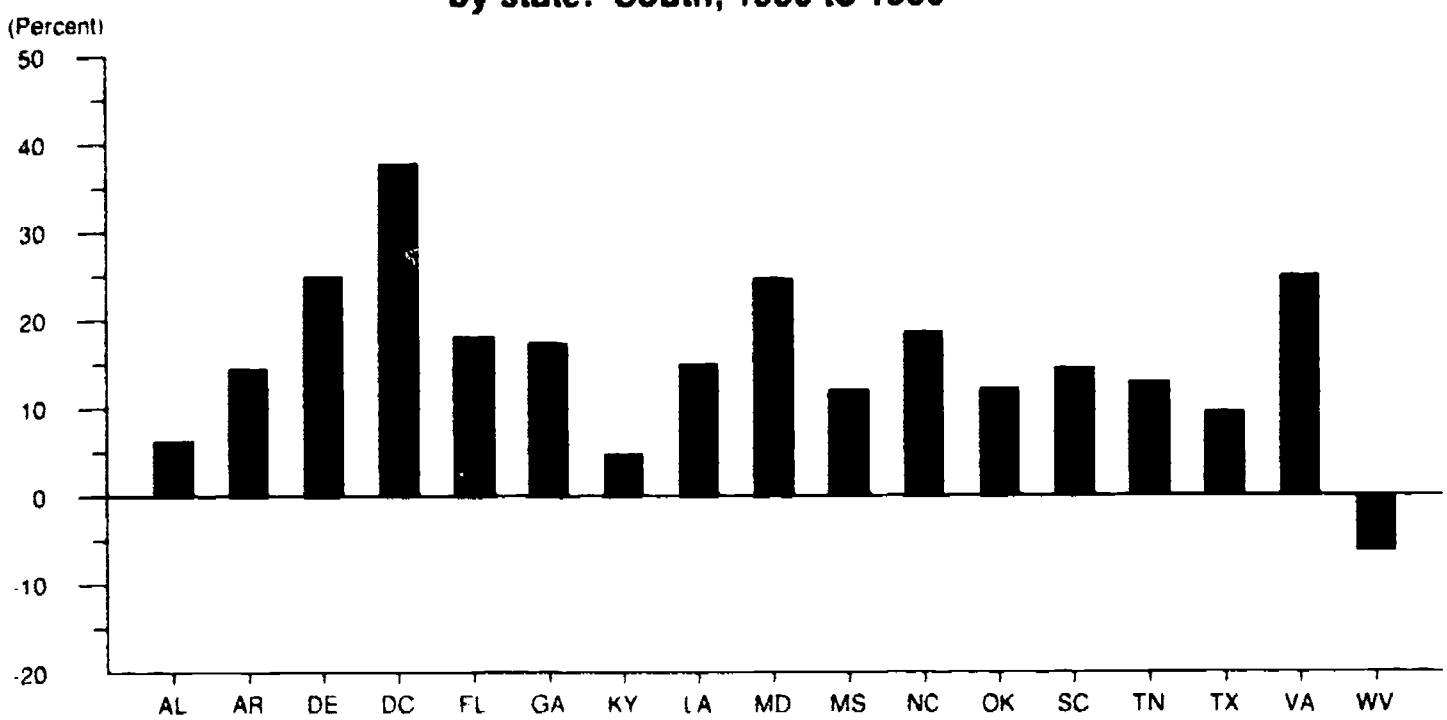


Figure 84

Percent change in public 9-12 enrollment, by state: South, 1996 to 2002

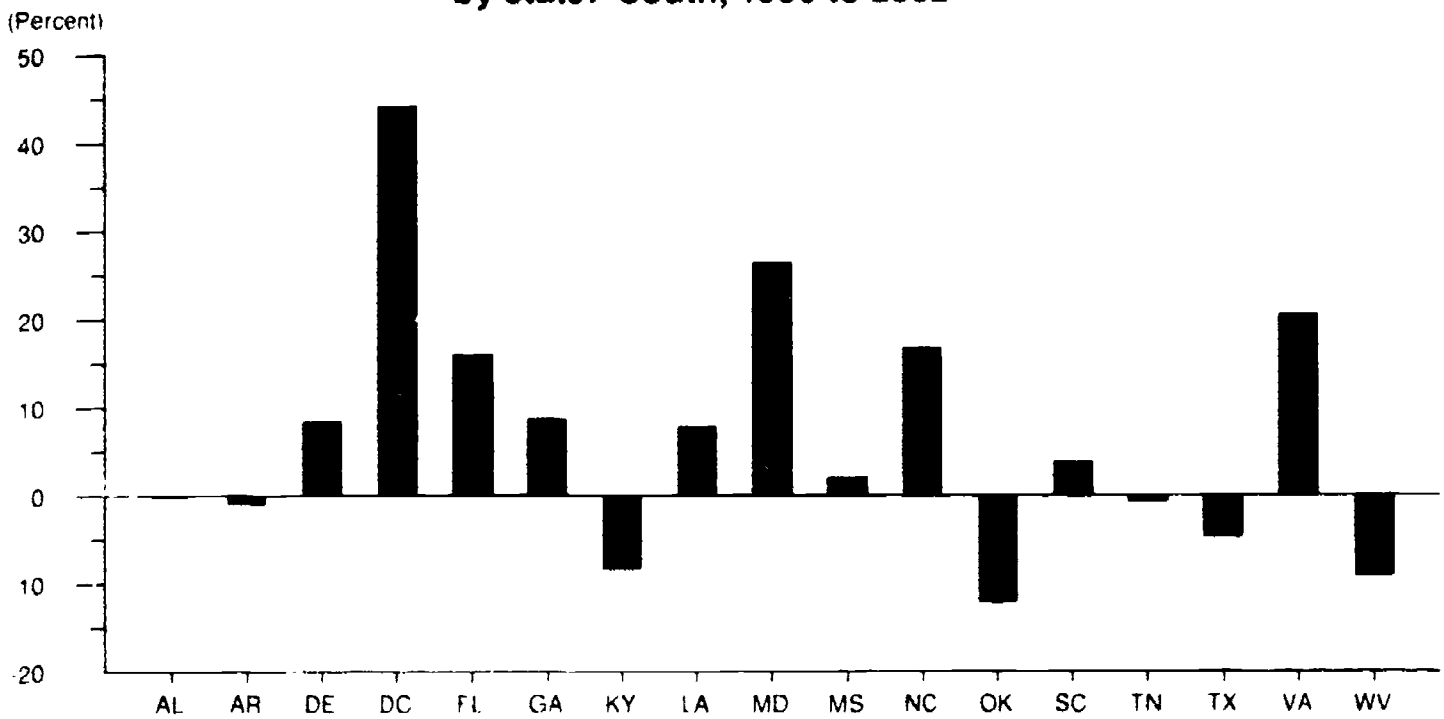


Figure 85

Percent change in public 9-12 enrollment, by state: West, 1990 to 1996

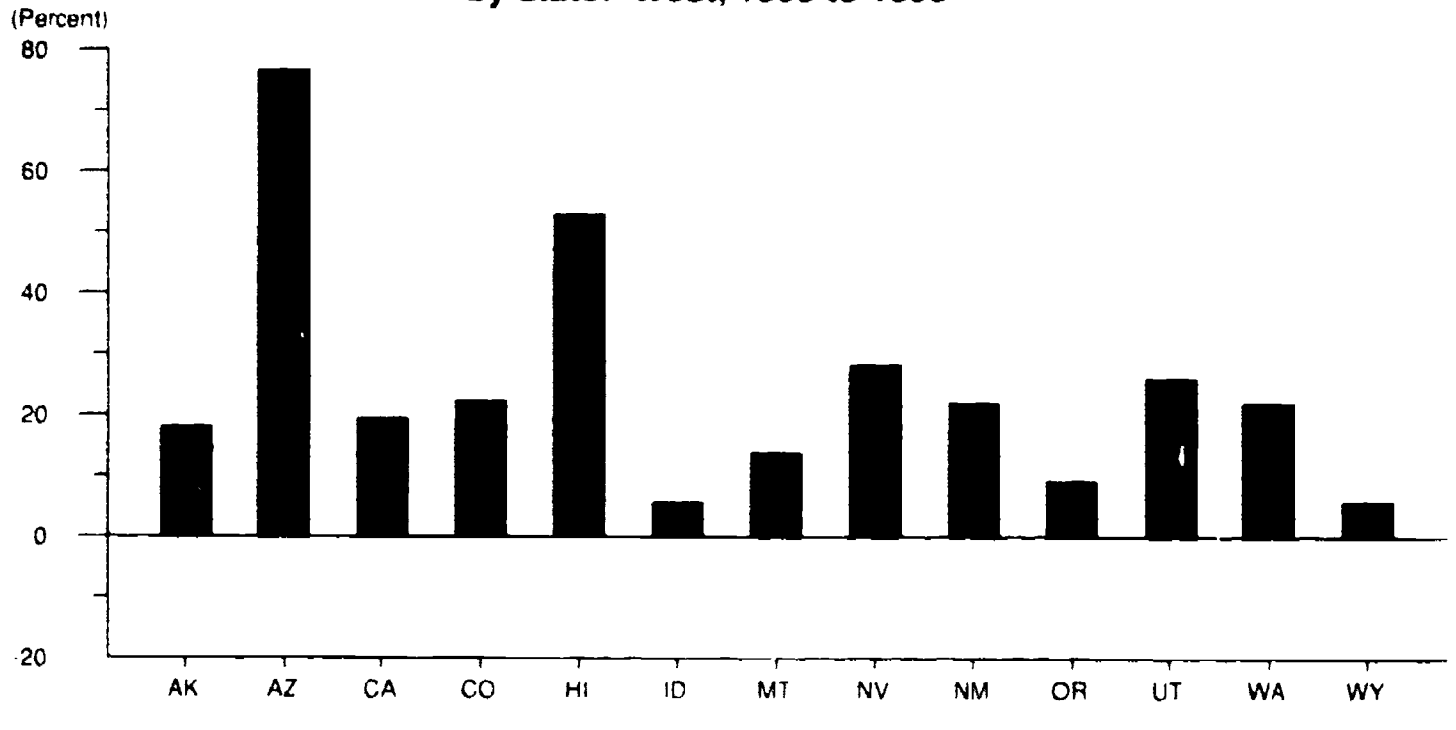


Figure 86

Percent change in public 9-12 enrollment, by state: West, 1996 to 2002

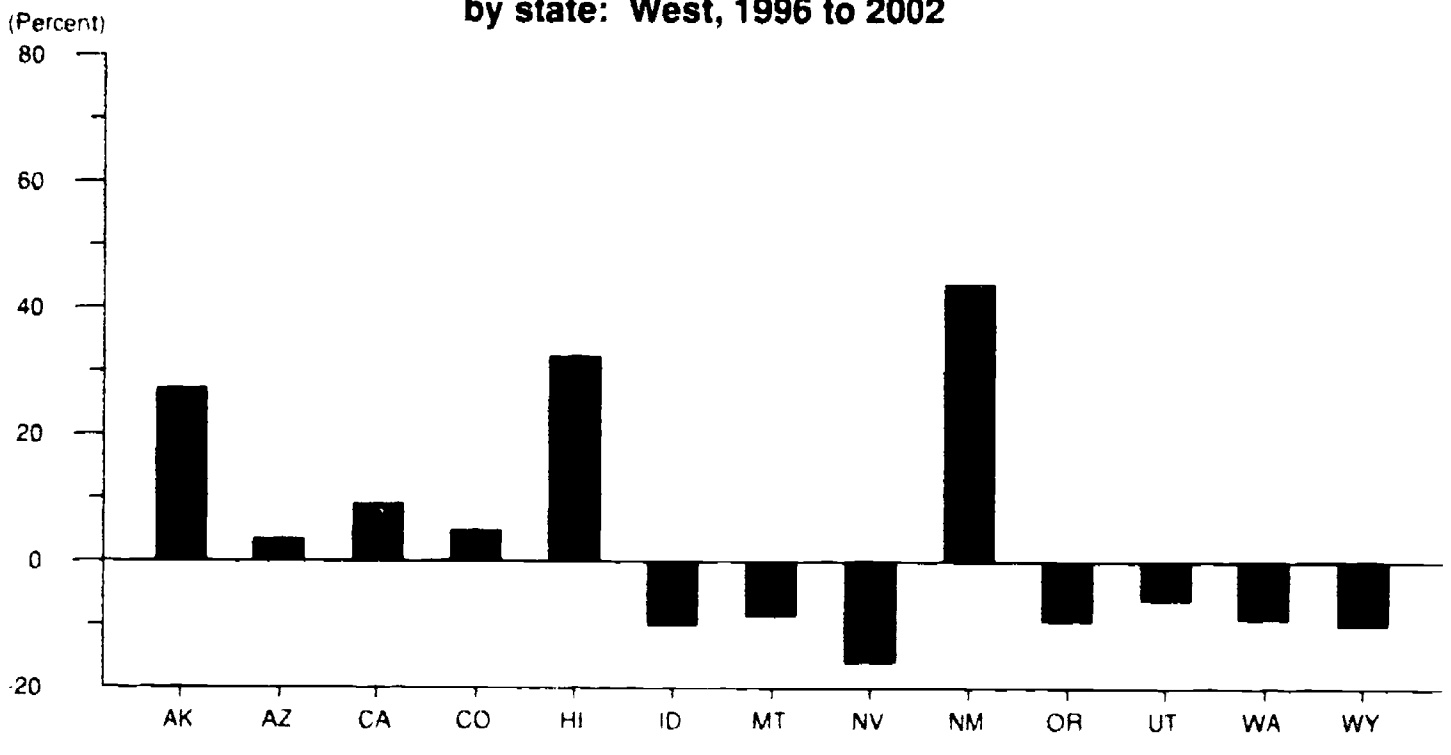


Table 37.—Enrollment in grades K–12 in public elementary and secondary schools, by region and state, with projections: Fall 1984 to fall 2002

(In thousands)

Region and state	Actual					Estimate		Projected		
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
United States	39,208	39,422	39,753	40,008	40,189	40,526	41,026	41,575	42,250	42,971
Northeast	7,396	7,317	7,295	7,252	7,208	7,202	7,243	7,339	7,461	7,608
Connecticut	468	462	469	465	461	462	469	477	488	500
Maine	208	206	212	212	213	214	216	218	220	226
Massachusetts	859	844	834	825	823	826	829	846	863	885
New Hampshire	159	161	164	166	169	172	171	181	189	197
New Jersey	1,129	1,116	1,107	1,093	1,081	1,076	1,083	1,101	1,126	1,161
New York	2,646	2,621	2,608	2,594	2,574	2,566	2,563	2,599	2,633	2,674
Pennsylvania	1,702	1,687	1,674	1,669	1,660	1,655	1,668	1,680	1,701	1,721
Rhode Island	135	134	135	135	134	136	138	139	142	145
Vermont	90	90	92	93	93	95	96	97	99	100
Midwest	9,889	9,861	9,871	9,868	9,842	9,851	9,899	9,923	10,055	10,133
Illinois	1,834	1,826	1,825	1,811	1,795	1,797	1,803	1,811	1,826	1,849
Indiana	973	966	967	964	961	954	956	962	968	970
Iowa	491	485	481	481	478	478	484	477	475	471
Kansas	405	410	416	421	427	431	436	442	448	452
Michigan	1,689	1,683	1,693	1,689	1,683	1,677	1,677	1,589	1,601	1,615
Minnesota	702	705	711	721	725	740	752	767	779	789
Missouri	794	795	801	802	803	808	810	826	838	850
Nebraska	266	266	267	268	269	271	274	274	275	274
North Dakota	119	119	119	119	119	118	117	117	117	117
Ohio	1,805	1,794	1,794	1,793	1,779	1,767	1,770	1,775	1,787	1,798
South Dakota	123	124	125	127	127	127	129	131	132	133
Wisconsin	768	768	768	772	778	783	791	802	810	814
South	13,963	14,117	14,312	14,419	14,492	14,589	14,761	14,889	15,117	15,379
Alabama	713	720	734	729	728	723	728	726	730	735
Arkansas	433	433	437	437	436	438	438	438	441	443
Delaware	92	93	94	96	97	98	100	102	106	108
District of Columbia	87	87	86	86	85	81	80	81	81	84
Florida	1,524	1,562	1,607	1,665	1,721	1,772	1,862	1,893	1,967	2,039
Georgia	1,062	1,080	1,096	1,111	1,108	1,127	1,152	1,179	1,208	1,239
Kentucky	644	647	643	643	638	631	630	623	621	618
Louisiana	801	788	795	793	787	783	770	767	766	770
Maryland	674	672	676	684	689	699	718	730	766	797
Mississippi	466	471	490	500	503	502	500	496	497	498
North Carolina	1,089	1,086	1,085	1,086	1,083	1,081	1,083	1,089	1,121	1,150
Oklahoma	590	592	593	584	580	579	579	574	572	570
South Carolina	603	607	612	615	616	616	622	628	636	645
Tennessee	817	814	818	824	822	820	822	827	835	845
Texas	3,040	3,132	3,210	3,243	3,284	3,329	3,353	3,370	3,408	3,433
Virginia	968	968	978	979	982	988	998	1,025	1,056	1,095
West Virginia	363	358	352	344	336	328	323	313	306	300
West	7,960	8,126	8,275	8,465	8,643	8,886	9,135	9,374	9,617	9,851
Alaska	108	107	108	106	106	109	112	111	114	116
Arizona	530	548	535	572	575	608	590	660	685	709
California	4,151	4,256	4,378	4,489	4,618	4,732	4,963	5,101	5,260	5,415
Colorado	545	551	558	560	560	563	569	576	586	596
Hawaii	164	164	165	166	167	169	171	176	182	190
Idaho	208	209	208	212	215	215	221	215	214	213
Montana	154	154	153	152	152	151	152	151	150	150
Nevada	152	155	161	168	176	187	197	206	214	221
New Mexico	272	278	282	287	292	296	300	305	311	318
Oregon	447	448	449	456	462	472	485	482	488	491
Utah	390	403	416	423	431	437	445	445	449	451
Washington	731	750	761	776	791	810	832	852	872	889
Wyoming	101	103	101	98	98	97	98	94	93	91

Table 37.—Enrollment in grades K–12 in public elementary and secondary schools, by region and state, with projections: Fall 1984 to fall 2002—Continued

(In thousands)

Region and state	Projected								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
United States	43,749	44,442	45,074	45,588	45,955	46,276	46,539	46,782	47,068
Northeast	7,737	7,862	7,982	8,091	8,184	8,591	8,662	8,728	8,791
Connecticut	508	517	524	530	535	545	549	551	552
Maine	231	237	244	248	254	257	261	264	266
Massachusetts	903	922	941	957	972	972	983	992	1,000
New Hampshire	205	213	219	224	230	233	239	243	249
New Jersey	1,195	1,230	1,268	1,306	1,341	1,459	1,480	1,499	1,516
New York	2,702	2,728	2,755	2,781	2,800	3,000	3,025	3,042	3,058
Pennsylvania	1,743	1,761	1,775	1,785	1,789	1,849	1,856	1,864	1,874
Rhode Island	147	149	150	151	151	156	157	159	159
Vermont	103	105	107	109	110	111	113	115	116
Midwest	10,266	10,364	10,434	10,460	10,443	10,485	10,489	10,520	10,538
Illinois	1,894	1,918	1,952	1,983	2,005	2,130	2,135	2,144	2,153
Indiana	980	986	989	988	983	975	979	985	990
Iowa	473	468	463	453	449	444	437	432	427
Kansas	457	461	463	461	458	459	455	454	451
Michigan	1,631	1,644	1,652	1,653	1,647	1,721	1,728	1,742	1,750
Minnesota	802	810	814	812	806	769	770	772	773
Missouri	869	886	902	916	926	911	917	924	930
Nebraska	277	278	278	277	273	260	258	255	252
North Dakota	118	119	119	119	119	114	110	107	105
Ohio	1,818	1,832	1,844	1,849	1,850	1,781	1,783	1,793	1,797
South Dakota	137	139	141	144	144	143	142	142	141
Wisconsin	821	822	817	807	793	776	774	772	769
South	15,677	15,960	16,242	16,496	16,720	16,623	16,738	16,826	16,953
Alabama	745	755	764	772	779	769	772	775	779
Arkansas	449	454	458	462	464	458	458	457	457
Delaware	111	114	117	119	122	121	123	127	129
District of Columbia	88	86	88	91	94	102	101	101	100
Florida	2,119	2,184	2,242	2,296	2,345	2,299	2,356	2,406	2,459
Georgia	1,271	1,303	1,333	1,369	1,402	1,380	1,409	1,436	1,464
Kentucky	620	621	621	619	617	618	617	615	615
Louisiana	779	790	802	812	819	862	850	837	828
Maryland	824	849	875	901	926	930	958	974	989
Mississippi	504	510	518	523	529	544	546	548	550
North Carolina	1,384	1,220	1,288	1,297	1,330	1,361	1,384	1,406	1,430
Oklahoma	568	565	560	553	546	521	507	492	481
South Carolina	658	669	679	690	699	682	688	694	702
Tennessee	860	873	886	896	903	911	917	922	928
Texas	3,463	3,488	3,514	3,528	3,534	3,394	3,369	3,333	3,316
Virginia	1,138	1,182	1,220	1,256	1,322	1,373	1,397	1,418	1,441
West Virginia	298	296	293	289	285	290	288	286	285
West	10,070	10,256	10,418	10,538	10,668	10,578	10,649	10,708	10,787
Alaska	118	122	127	132	138	139	141	143	145
Arizona	728	748	767	767	773	783	771	784	796
California	5,546	5,660	5,763	5,848	5,903	5,932	5,998	6,057	6,128
Colorado	606	616	625	633	637	627	621	613	609
Hawaii	198	208	214	223	231	250	251	251	251
Idaho	215	216	216	215	213	208	207	206	205
Montana	151	151	150	150	148	146	144	142	139
Nevada	226	229	230	228	225	214	215	217	218
New Mexico	327	336	336	336	364	395	399	402	406
Oregon	499	503	506	504	499	482	481	481	481
Utah	461	469	478	480	483	488	488	488	491
Washington	983	991	994	990	998	851	846	841	836
Wyoming	92	97	97	92	97	88	87	85	83

NOTE: Includes most kindergarten and some nursery school enrollment.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys and "Key Statistics for Public and Private Elementary and Secondary Education School Year 1990-1991," *Early Estimates*. (This table was prepared June 1991.)

Table 38—Percent change in grades K–12 enrollment in public schools, by region and state, with projections: Fall 1984 to fall 2002

Region and state	Actual	Projected		
	1984 to 1990	1990 to 1996	1996 to 2002	1990 to 2002
United States	4.6	9.9	4.4	14.7
Northeast	2.2	10.4	10.1	21.8
Connecticut	0.2	11.7	5.5	17.8
Maine	3.8	12.8	9.3	23.3
Massachusetts	3.5	13.5	6.3	20.6
New Hampshire	7.5	28.0	13.8	48.7
New Jersey	4.1	17.1	19.5	40.0
New York	3.1	7.5	11.0	19.3
Pennsylvania	2.0	6.4	5.5	12.3
Rhode Island	3.0	9.0	5.9	15.4
Vermont	6.7	11.3	8.5	20.2
Midwest	0.1	5.4	1.0	6.5
Illinois	1.7	8.3	10.3	19.4
Indiana	1.7	3.5	0.0	3.5
Iowa	1.4	4.4	7.2	11.8
Kansas	7.7	6.1	2.6	8.8
Michigan	2.0	4.8	5.9	11.0
Minnesota	7.1	8.3	5.0	2.8
Missouri	2.0	11.4	3.1	14.9
Nebraska	3.0	1.4	9.2	7.9
North Dakota	1.7	1.7	11.7	10.2
Ohio	1.9	4.2	2.6	1.5
South Dakota	4.9	9.3	0.2	9.1
Wisconsin	3.0	3.3	5.9	2.8
South	5.7	10.0	4.4	14.9
Alabama	2.1	5.0	1.9	7.0
Arkansas	0.5	5.4	0.3	5.1
Delaware	8.7	17.2	10.0	28.9
District of Columbia	8.0	10.2	13.0	24.8
Florida	22.2	20.4	9.7	32.1
Georgia	8.5	16.0	9.8	27.1
Kentucky	2.2	1.4	1.0	2.4
Louisiana	2.7	2.9	3.8	6.4
Maryland	6.1	22.4	13.0	38.3
Mississippi	7.3	3.5	6.3	10.0
North Carolina	0.6	16.2	13.6	32.0
Oklahoma	1.9	3.3	14.1	17.0
South Carolina	3.2	9.2	3.3	12.8
Tennessee	0.6	7.7	4.8	12.9
Texas	10.3	4.8	8.6	13.1
Virginia	3.4	23.1	17.3	44.4
West Virginia	1.0	9.1	3.0	11.8
West	14.8	14.0	3.6	18.1
Alaska	6.7	13.0	14.7	29.6
Arizona	11.3	28.3	5.1	34.9
California	19.6	16.1	6.3	23.8
Colorado	4.4	9.9	2.7	7.0
Hawaii	4.3	24.9	17.6	46.9
Idaho	6.3	2.4	5.1	7.4
Montana	1.3	1.1	7.8	8.8
Nevada	29.6	16.9	5.8	10.5
New Mexico	10.3	18.5	17.2	35.4
Oregon	8.5	4.4	5.0	0.9
Utah	14.1	6.2	3.8	10.2
Washington	12.3	9.8	8.5	4.5
Wyoming	3.0	6.0	9.5	14.9

NOTE: Includes most kindergarten and some nursery school enrollment.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data surveys and "Key Statistics for Public and Private Elementary and Secondary Education: School Year 1990-91," *Early Estimates*. (This table was prepared June 1991.)

Table 39.—Enrollment in grades K–8 in public schools, by region and state, with projections: Fall 1984 to fall 2002

(In thousands)

Region and state	Actual						Estimate	Projected		
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
United States	26,901	27,030	27,421	27,932	28,503	29,158	29,742	30,186	30,663	31,091
Northeast	4,852	4,816	4,843	4,903	4,990	5,028	5,181	5,264	5,361	5,468
Connecticut	323	321	322	326	332	338	349	357	367	378
Maine	142	140	144	145	149	152	154	157	160	163
Massachusetts	566	559	559	565	578	590	606	621	637	655
New Hampshire	106	107	110	114	120	124	130	136	141	147
New Jersey	747	740	742	747	755	766	783	800	824	852
New York	1,712	1,703	1,713	1,736	1,761	1,780	1,813	1,831	1,853	1,881
Pennsylvania	1,103	1,093	1,098	1,111	1,133	1,151	1,174	1,188	1,201	1,213
Rhode Island	90	90	92	94	95	98	101	102	105	106
Vermont	63	63	63	65	67	69	71	71	72	74
Midwest	6,699	6,671	6,713	6,794	6,894	7,000	7,098	7,137	7,173	7,185
Illinois	1,254	1,246	1,249	1,252	1,259	1,280	1,288	1,294	1,305	1,318
Indiana	662	654	654	659	668	671	681	682	682	680
Iowa	329	324	324	328	334	338	339	336	330	323
Kansas	282	286	292	299	307	314	319	322	323	324
Michigan	1,090	1,086	1,090	1,093	1,114	1,128	1,145	1,153	1,161	1,166
Minnesota	464	468	479	497	511	529	543	552	558	559
Missouri	545	544	549	557	568	576	588	594	601	606
Nebraska	185	184	185	188	191	194	197	197	196	195
North Dakota	84	84	84	84	85	85	85	84	83	82
Ohio	1,220	1,206	1,208	1,220	1,229	1,242	1,256	1,262	1,268	1,269
South Dakota	87	88	89	91	93	94	95	96	96	96
Wisconsin	497	501	510	522	535	549	563	567	569	566
South	9,830	9,924	10,096	10,246	10,414	10,618	10,798	10,982	11,128	11,287
Alabama	514	517	519	521	522	526	529	531	533	536
Arkansas	305	304	307	307	309	311	314	315	316	316
Delaware	62	63	65	67	69	71	74	76	76	79
District of Columbia	63	62	62	63	62	61	61	61	62	64
Florida	1,062	1,086	1,121	1,172	1,232	1,303	1,364	1,426	1,488	1,548
Georgia	746	767	778	795	808	828	854	878	898	920
Kentucky	451	449	447	449	452	452	451	445	440	434
Louisiana	579	573	581	583	581	582	577	573	570	567
Maryland	446	446	456	473	489	503	520	539	571	594
Mississippi	325	330	336	364	368	370	366	364	363	361
North Carolina	688	749	748	784	761	770	782	796	815	836
Oklahoma	417	414	417	411	414	421	422	418	413	408
South Carolina	422	424	428	432	438	444	451	456	462	467
Tennessee	581	575	577	582	586	590	597	602	608	612
Texas	2,189	2,261	2,313	2,351	2,392	2,443	2,468	2,493	2,516	2,532
Virginia	662	668	673	688	699	712	733	758	787	812
West Virginia	258	249	244	243	242	227	223	216	210	204
West	5,510	5,617	5,767	5,990	6,207	6,461	6,668	6,835	7,003	7,150
Alaska	75	77	78	77	79	82	82	84	84	86
Arizona	373	386	371	413	418	451	478	495	513	530
California	2,846	2,927	3,046	3,172	3,312	3,431	3,611	3,728	3,850	3,967
Colorado	376	379	386	392	400	408	414	421	428	432
Hawaii	112	112	115	118	120	123	126	129	133	138
Idaho	149	149	150	153	156	157	155	153	152	149
Montana	109	108	108	108	110	110	109	108	108	106
Nevada	105	107	112	119	127	133	145	151	158	162
New Mexico	195	187	191	195	200	203	208	212	216	221
Oregon	306	305	309	318	328	340	342	345	347	347
Utah	289	299	308	314	319	323	322	319	316	311
Washington	502	507	521	541	563	586	607	630	653	659
Wyoming	73	74	72	70	70	70	69	67	66	64

Table 39.—Enrollment in grades K–8 in public schools, by region and state, with projections: Fall 1984 to fall 2002—Continued

(In thousands)

Region and state	Projected								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
United States	31,451	31,782	32,068	32,343	32,661	32,843	33,032	33,172	33,245
Northeast	5,539	5,613	5,678	5,745	5,812	6,029	6,058	6,066	6,056
Connecticut	383	389	394	398	403	417	418	416	414
Maine	167	172	176	179	183	185	187	188	191
Massachusetts	667	679	689	700	709	712	715	716	715
New Hampshire	151	155	160	164	168	171	175	178	180
New Jersey	877	903	928	953	976	1,056	1,067	1,073	1,074
New York	1,890	1,902	1,912	1,922	1,934	2,020	2,022	2,020	2,011
Pennsylvania	1,221	1,229	1,234	1,241	1,248	1,276	1,279	1,279	1,276
Rhode Island	107	108	108	109	111	114	115	115	115
Vermont	75	77	78	79	80	78	79	80	81
Midwest	7,222	7,253	7,277	7,323	7,357	7,398	7,424	7,432	7,425
Illinois	1,338	1,358	1,377	1,399	1,421	1,497	1,506	1,513	1,515
Indiana	682	685	689	694	698	691	696	699	701
Iowa	319	314	309	305	300	300	299	295	291
Kansas	324	323	321	319	318	321	320	318	316
Michigan	1,169	1,173	1,177	1,186	1,192	1,253	1,259	1,261	1,259
Minnesota	562	564	563	564	565	542	543	544	543
Missouri	615	623	630	639	646	640	645	648	650
Nebraska	195	194	193	192	190	182	181	180	178
North Dakota	82	80	79	78	77	73	72	70	69
Ohio	1,274	1,279	1,283	1,293	1,302	1,258	1,262	1,265	1,265
South Dakota	97	97	98	98	98	97	97	97	97
Wisconsin	565	563	559	556	552	545	544	542	539
South	11,434	11,583	11,721	11,838	11,994	11,947	12,033	12,111	12,169
Alabama	540	547	553	559	566	560	563	565	567
Arkansas	317	319	320	322	323	318	319	320	320
Delaware	81	82	84	86	88	88	90	92	93
District of Columbia	63	63	62	62	63	66	64	64	62
Florida	1,588	1,621	1,655	1,684	1,717	1,683	1,717	1,750	1,778
Georgia	980	992	987	1,011	1,038	1,024	1,046	1,066	1,084
Kentucky	433	434	434	435	437	442	443	444	443
Louisiana	568	570	569	566	567	595	589	583	578
Maryland	611	627	643	657	672	673	682	690	695
Mississippi	363	365	368	371	376	386	390	393	397
North Carolina	856	879	902	925	952	974	989	1,003	1,014
Oklahoma	402	94	384	373	365	348	339	[illegible]	326
South Carolina	472	478	484	491	498	487	491	496	499
Tennessee	619	624	632	638	646	662	668	673	676
Texas	2,542	2,547	2,545	2,531	2,532	2,436	2,421	2,408	2,392
Virginia	840	870	899	927	956	1,003	1,019	1,033	1,043
West Virginia	202	201	199	199	199	202	201	200	199
West	7,256	7,333	7,393	7,439	7,497	7,469	7,517	7,563	7,595
Alaska	88	89	91	94	97	96	97	100	100
Arizona	540	548	555	561	567	561	570	578	587
California	4,043	4,102	4,148	4,188	4,234	4,263	4,303	4,339	4,368
Colorado	434	436	436	434	434	424	420	415	411
Hawaii	141	144	145	147	149	159	158	160	161
Idaho	148	147	146	146	146	143	143	143	142
Montana	105	104	102	101	99	98	96	95	94
Nevada	164	168	164	164	163	158	160	161	162
New Mexico	226	229	234	239	244	239	241	243	244
Oregon	350	350	350	350	350	341	340	340	339
Utah	313	316	320	323	329	332	337	341	345
Washington	641	642	639	634	628	598	594	590	586
Wyoming	63	62	62	60	61	57	57	56	56

NOTE: Includes most kindergarten and some nursery school enrollment.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys and [illegible]y Statistics for Public and Private Elementary and Secondary Education, School Year 1990-1991," *Early Estimates*. (This table was prepared June 1991.)

Table 40.—Percent change in grades K–8 enrollment in public schools, by region and state, with projections: Fall 1984 to fall 2002

Region and state	Actual	Projected		
	1984 to 1990	1990 to 1996	1996 to 2002	1990 to 2002
United States	10.6	7.8	3.7	11.8
Northeast	6.8	9.6	6.7	16.9
Connecticut	8.1	12.8	5.1	18.6
Maine	8.8	13.7	8.5	23.3
Massachusetts	7.0	13.7	3.8	18.0
New Hampshire	22.5	23.2	12.2	38.2
New Jersey	4.9	18.4	15.8	37.1
New York	5.9	5.5	5.2	11.0
Pennsylvania	6.4	5.2	3.4	8.7
Rhode Island	12.6	6.6	6.4	13.5
Vermont	12.1	10.3	4.0	14.7
Midwest	6.0	2.5	2.0	4.6
Illinois	2.7	6.9	10.1	17.7
Indiana	2.9	1.1	1.7	2.9
Iowa	3.1	9.0	5.6	14.1
Kansas	13.1	0.6	1.4	0.8
Michigan	5.0	2.8	7.0	10.0
Minnesota	17.0	3.8	3.6	0.1
Missouri	7.9	7.1	3.3	10.6
Nebraska	6.3	1.7	7.6	-9.2
North Dakota	1.6	7.5	-12.6	-19.2
Ohio	2.9	2.2	1.4	0.7
South Dakota	9.7	2.4	0.2	2.1
Wisconsin	13.2	0.7	3.6	-4.3
South	9.7	8.6	3.8	12.7
Alabama	2.8	4.6	2.6	7.3
Arkansas	2.9	1.9	0.1	1.8
Delaware	18.6	14.5	10.6	26.6
District of Columbia	2.8	1.8	0.1	1.9
Florida	28.8	21.3	7.4	30.3
Georgia	14.4	15.6	9.8	27.0
Kentucky	0.1	3.8	2.1	1.8
Louisiana	0.4	1.3	1.8	0.2
Maryland	18.8	21.7	8.1	31.5
Mississippi	12.7	0.4	8.1	8.6
North Carolina	3.6	15.3	12.4	29.6
Oklahoma	1.3	9.0	15.1	22.7
South Carolina	7.0	7.3	3.1	10.6
Tennessee	2.7	5.8	7.0	13.2
Texas	12.7	3.1	6.0	3.0
Virginia	9.9	22.6	16.1	42.3
West Virginia	12.7	10.4	0.1	-10.5
West	21.0	10.9	2.7	13.9
Alaska	9.7	11.1	9.9	22.2
Arizona	27.5	16.7	5.8	23.4
California	26.9	14.9	5.3	20.9
Colorado	10.2	5.3	5.9	0.9
Hawaii	12.8	15.1	10.7	27.3
Idaho	4.3	5.8	2.8	8.5
Montana	0.3	6.9	7.5	13.9
Nevada	38.8	12.9	1.3	11.4
New Mexico	6.8	12.6	4.5	17.6
Oregon	11.8	2.4	3.1	0.8
Utah	11.4	0.6	7.8	7.1
Washington	20.9	5.3	8.3	3.5
Wyoming	5.3	10.9	0.3	10.2

NOTE: Includes most kindergarten and some nursery school enrollment.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data surveys and "Key Statistics for Public and Private Elementary and Secondary Education School Year 1990-91," *Early Estimates*. (This table was prepared June 1991.)

Table 41.—Enrollment in grades 9–12 in public schools, by region and state, with projections: Fall 1984 to fall 2002

(In thousands)

Region and state	Actual						Estimate	Projected		
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
United States	12,308	12,392	12,333	12,076	11,686	11,369	11,284	11,389	11,587	11,880
Northeast	2,543	2,502	2,451	2,348	2,220	2,121	2,052	2,075	2,100	2,140
Connecticut	145	141	137	130	129	123	120	120	120	122
Maine	65	66	68	66	64	62	62	60	60	63
Massachusetts	293	285	275	260	246	235	223	225	226	230
New Hampshire	53	54	54	52	50	47	41	46	48	50
New Jersey	382	376	365	346	326	310	300	300	302	309
New York	934	918	893	859	813	776	750	768	779	793
Pennsylvania	599	591	576	557	527	505	494	493	500	509
Rhode Island	45	44	43	41	38	37	37	37	37	38
Vermont	27	27	29	28	27	26	25	26	26	26
Midwest	3,190	3,192	3,158	3,076	2,952	2,852	2,801	2,836	2,883	2,948
Illinois	580	580	576	560	536	517	515	517	521	531
Indiana	311	312	313	305	293	283	275	280	285	290
Iowa	162	161	158	152	144	140	145	141	145	148
Kansas	123	125	125	123	120	117	117	120	125	128
Michigan	519	517	507	492	469	449	432	436	440	449
Minnesota	238	237	232	225	216	211	209	215	222	230
Missouri	249	251	251	245	239	232	222	232	237	244
Nebraska	81	82	82	80	78	77	77	77	78	79
North Dakota	35	35	35	35	34	33	32	33	34	35
Ohio	585	588	585	573	549	525	514	514	519	529
South Dakota	37	37	36	35	34	34	34	35	36	37
Wisconsin	270	267	258	251	240	234	228	235	241	248
South	4,123	4,193	4,216	4,172	4,079	3,972	3,966	3,938	3,992	4,092
Alabama	198	213	215	208	203	198	199	195	197	199
Arkansas	128	130	131	130	127	124	121	123	125	127
Delaware	30	30	30	29	28	27	26	27	29	29
District of Columbia	25	25	23	24	22	21	19	20	19	20
Florida	462	476	486	493	489	469	498	467	479	504
Georgia	316	323	318	316	308	298	298	304	310	319
Kentucky	193	195	196	194	186	179	179	177	181	184
Louisiana	222	215	214	210	206	201	202	194	197	203
Maryland	228	228	220	211	200	192	186	190	196	203
Mississippi	141	141	143	141	136	133	134	132	135	136
North Carolina	333	332	337	332	322	311	301	302	306	314
Oklahoma	173	178	176	173	167	158	157	156	158	162
South Carolina	180	183	184	183	178	172	171	171	174	179
Tennessee	236	239	241	241	236	230	225	225	227	233
Texas	852	871	892	886	892	885	885	887	892	902
Virginia	298	303	302	294	283	273	265	269	274	283
West Virginia	108	109	108	107	104	100	100	97	95	96
West	2,451	2,508	2,510	2,477	2,437	2,425	2,467	2,539	2,614	2,701
Alaska	29	30	30	29	28	28	30	28	29	30
Arizona	157	162	163	160	157	156	115	165	172	179
California	1,308	1,329	1,332	1,317	1,301	1,301	1,352	1,373	1,410	1,449
Colorado	169	172	172	168	161	155	155	155	159	163
Hawaii	52	53	50	49	47	46	45	47	49	52
Idaho	59	59	59	59	59	58	66	60	62	65
Montana	46	46	46	44	43	41	43	43	42	43
Nevada	47	48	49	49	49	49	52	54	56	60
New Mexico	88	90	91	92	92	93	95	93	95	97
Oregon	141	142	141	138	134	132	143	137	141	144
Utah	101	105	108	109	112	115	123	126	133	140
Washington	230	243	240	235	228	224	225	232	240	250
Wyoming	28	29	29	28	27	27	29	27	27	28

Table 41.—Enrollment in grades 9–12 in public schools, by region and state, with projections: Fall 1984 to fall 2002—Continued

(In thousands)

Region and state	Projected								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
United States	12,298	12,660	13,086	13,242	13,294	13,433	13,507	13,610	13,823
Northeast	2,197	2,249	2,305	2,346	2,371	2,562	2,604	2,662	2,735
Connecticut	125	128	130	132	132	128	131	135	138
Maine	64	65	68	70	71	71	74	75	76
Massachusetts	237	244	252	257	263	260	268	276	285
New Hampshire	54	57	59	60	62	62	64	66	70
New Jersey	318	327	341	353	365	403	412	425	442
New York	812	826	843	859	866	990	1,003	1,022	1,047
Pennsylvania	522	532	541	544	541	573	576	585	598
Rhode Island	39	41	42	42	41	41	43	44	44
Vermont	27	28	29	30	30	33	33	35	35
Midwest	3,044	3,111	3,157	3,138	3,086	3,087	3,065	3,088	3,113
Illinois	546	560	575	584	585	633	628	631	638
Indiana	298	301	301	295	286	284	283	287	289
Iowa	153	155	154	148	139	143	139	137	135
Kansas	133	138	142	142	140	138	135	135	134
Michigan	462	471	475	466	455	468	469	481	491
Minnesota	241	247	251	248	242	227	227	228	230
Missouri	254	263	273	277	279	274	273	276	280
Nebraska	82	84	85	84	83	78	77	75	74
North Dakota	36	39	40	41	42	41	39	37	36
Ohio	543	553	561	556	548	523	521	525	532
South Dakota	40	42	43	46	46	46	45	44	43
Wisconsin	256	259	258	251	242	231	230	230	230
South	4,243	4,377	4,521	4,660	4,726	4,676	4,705	4,715	4,784
Alabama	205	208	212	213	213	209	209	210	212
Arkansas	132	135	138	141	141	139	138	137	137
Delaware	30	32	33	33	34	33	33	34	36
District of Columbia	21	24	26	29	32	36	37	37	37
Florida	534	563	587	613	628	616	638	655	681
Georgia	331	342	350	358	364	356	363	370	380
Kentucky	187	187	187	184	180	176	174	171	172
Louisiana	211	220	232	246	252	268	261	255	250
Maryland	213	222	232	244	254	266	275	284	294
Mississippi	141	145	150	152	152	158	156	155	153
North Carolina	328	341	356	373	384	387	395	403	416
Oklahoma	167	171	176	180	181	173	168	160	155
South Carolina	186	190	195	199	202	195	196	198	202
Tennessee	241	249	254	258	256	249	249	249	253
Texas	922	941	968	998	1,002	958	939	928	924
Virginia	297	312	330	350	366	370	378	385	398
West Virginia	97	95	94	91	86	88	86	86	86
West	2,814	2,923	3,122	3,098	3,111	3,109	3,132	3,145	3,191
Alaska	31	37	35	39	41	43	44	43	45
Arizona	188	196	202	206	207	197	201	205	209
California	1,503	1,559	1,615	1,660	1,673	1,669	1,695	1,717	1,760
Colorado	172	180	189	199	203	203	201	198	198
Hawaii	57	61	68	76	82	92	92	91	90
Idaho	67	69	69	69	67	65	64	63	62
Montana	46	47	49	49	49	48	48	46	44
Nevada	62	64	66	65	62	56	56	55	56
New Mexico	101	106	113	118	121	156	158	159	162
Oregon	139	154	156	154	149	141	140	141	141
Utah	148	154	155	157	155	156	151	147	146
Washington	262	269	275	276	270	253	252	250	250
Wyoming	29	31	31	32	33	31	30	29	28

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys and "Key Statistics for Public and Private Elementary and Secondary Education School Year 1990-1991," *Early Estimates*. (This table was prepared June 1991.)

Table 42.—Percent change in grades 9–12 enrollment in public schools, by region and state, with projections: Fall 1984 to fall 2002

Region and state	Actual	Projected		
	1984 to 1990	1990 to 1996	1996 to 2002	1990 to 2002
United States	8.3	15.2	6.9	22.5
Northeast	-19.3	12.3	18.6	33.3
Connecticut	-17.3	8.4	6.5	15.4
Maine	-6.8	10.8	11.4	23.4
Massachusetts	-23.8	12.9	13.0	27.6
New Hampshire	22.4	43.1	18.2	69.1
New Jersey	21.6	13.7	29.8	47.6
New York	19.7	12.3	24.2	39.5
Pennsylvania	17.5	9.5	10.5	21.0
Rhode Island	16.6	15.4	4.5	20.6
Vermont	6.0	13.9	20.6	37.3
Midwest	12.2	12.7	-1.4	11.1
Illinois	11.2	11.7	10.8	23.8
Indiana	-11.6	9.3	3.8	5.2
Iowa	-10.5	6.2	12.0	6.6
Kansas	4.9	20.9	5.2	14.6
Michigan	16.7	9.8	3.4	13.5
Minnesota	-12.0	19.9	8.3	10.0
Missouri	10.8	22.7	2.6	26.0
Nebraska	4.8	9.4	12.8	4.6
North Dakota	9.5	26.4	9.9	13.9
Ohio	12.1	9.1	-5.1	3.5
South Dakota	6.7	29.2	0.1	29.0
Wisconsin	15.8	13.2	-10.9	0.9
South	3.8	14.0	5.8	20.6
Alabama	0.2	6.2	0.1	6.1
Arkansas	5.4	14.4	0.8	13.4
Delaware	11.7	24.8	8.4	35.2
District of Columbia	21.9	37.7	44.2	98.6
Florida	7.7	18.0	16.0	36.9
Georgia	-5.6	17.3	8.7	27.4
Kentucky	7.5	4.7	8.2	3.9
Louisiana	8.9	14.9	7.8	23.8
Maryland	18.3	24.6	26.4	57.5
Mississippi	5.1	11.9	2.0	14.1
North Carolina	10.0	18.5	16.7	38.3
Oklahoma	9.4	12.1	12.0	1.4
South Carolina	8.7	14.4	3.8	18.7
Tennessee	4.6	12.8	0.6	12.2
Texas	4.0	9.4	-4.6	4.3
Virginia	11.2	24.8	20.5	50.3
West Virginia	-7.1	-6.3	9.0	14.7
West	0.7	22.5	5.6	29.3
Alaska	0.8	18.0	27.2	50.1
Arizona	27.1	76.6	3.4	82.6
California	3.6	19.4	9.0	30.2
Colorado	8.6	22.3	4.8	28.2
Hawaii	-14.2	52.9	32.4	102.4
Idaho	11.0	5.7	9.9	4.8
Montana	5.2	13.8	8.5	4.2
Nevada	9.7	28.2	15.8	7.9
New Mexico	19.9	22.0	43.8	75.4
Oregon	1.4	9.1	9.3	1.1
Utah	21.8	26.0	6.0	18.4
Washington	5.8	22.0	8.9	11.2
Wyoming	3.1	5.8	9.8	4.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data surveys and "Key Statistics for Public and Private Elementary and Secondary Education, School Year 1990-91" (*Early Estimates*). (This table was prepared June 1991.)

Chapter 8

Public High School Graduates

The projected increases in public high school enrollment between 1990 and 2002 will cause corresponding increases in the number of public high school graduates. The annual number of public high school graduates is expected to increase between 1989-90 and 2001–2002. This increase will be reflected in many states, with 37 states showing increases (table 43 and figure 87). Each region of the country is expected to reflect this increase in the number of public high school graduates. A significant increase is expected in the West and smaller increases are projected for the South, Midwest, and Northeast.

The annual number of public high school graduates is expected to increase by 11 percent between 1989-90 and 2001–2002 (table 44). The percent change will vary among states, from an increase of 77 percent to a decrease of 26 percent (figure 88).

The Northeastern region is expected to have the smallest growth in the number of graduates, an increase of 3 percent between 1989–90 and 2001–2002. Increases are expected in all states in the region. These increases reverse the enrollment declines in all of the states during the late 1980s. Despite the overall small increase in the region, sizable increases are expected in New Hampshire (27 percent) and Rhode Island (17 percent). The number of graduates in Vermont is projected to increase by 10 percent over the projection period. Six states in the region are expected to show increases of less than 4 percent. Over the projection period, most of the states are projected to show decreases between 1989-90 and 1995-96. In contrast, all of the states are expected to show increases between 1995–96 and 2001-2002 (figures 89 and 90).

The number of public high school graduates in the Midwest is expected to increase by 4 percent between 1989-90 and 2001-2002, considerably less than the National average. The number of Midwestern high school graduates is expected to increase from 618,000 in 1989-90 to 641,000 in 2001-2002, an increase of 23,000 graduates. Increases are expected in Kansas (18 percent), Minnesota (25 percent), and South Dakota (12 percent). Seven of the states in the Midwestern region are expected to show no change or decline slightly. Most of the states will experience their greatest growth between 1995–96 and 2001-2002 (figures 91 and 92).

Increases in the number of public high school graduates are expected in the South, although the rate of increase is expected to be slower than the National average. Between 1984–85 and 1989–90, public high school graduates in the South increased by only 2 percent. Between 1989-90 and 1995–96, the number of graduates is projected to decline by 2 percent. This decline will reverse between 1995-96 and 2001–2002 and then increase by 9 percent. Overall, the number of graduates in the South is projected to increase from 808,000 in 1989–90 to 867,000 in 2001-2002, an increase of 7 percent. Significant increases are expected in Florida (40 percent), Georgia (26 percent), and Maryland (27 percent). Despite an overall increase in the region, nine Southern states are expected to have declines in the number of graduates. Sizable decreases are expected in the District of Columbia (26 percent), Kentucky (14 percent), Louisiana (16 percent), and West Virginia (26 percent). Over the projection period, most of the states are projected to show decreases between 1989-90 and 1995–96 and generally increases between 1995–96 and 2001-2002 (figures 93 and 94).

The number of high school graduates in the West is expected to increase substantially, rising by 36 percent. Sizable increases are expected in Arizona (47 percent), California (48 percent), Nevada (77 percent), and Washington (33 percent). Other increases are projected in Alaska (18 percent), New Mexico (19 percent), Oregon (16 percent), and Utah (16 percent). Decreases are expected in Montana (1 percent) and Wyoming (17 percent). Over the projection period, a majority of the states will experience their greatest growth in the number of graduates between 1995-96 and 2001-2002 (figures 95 and 96).

Figure 87

Number of high school graduates in public schools, by region, with projections: 1981-82 to 2001-2002

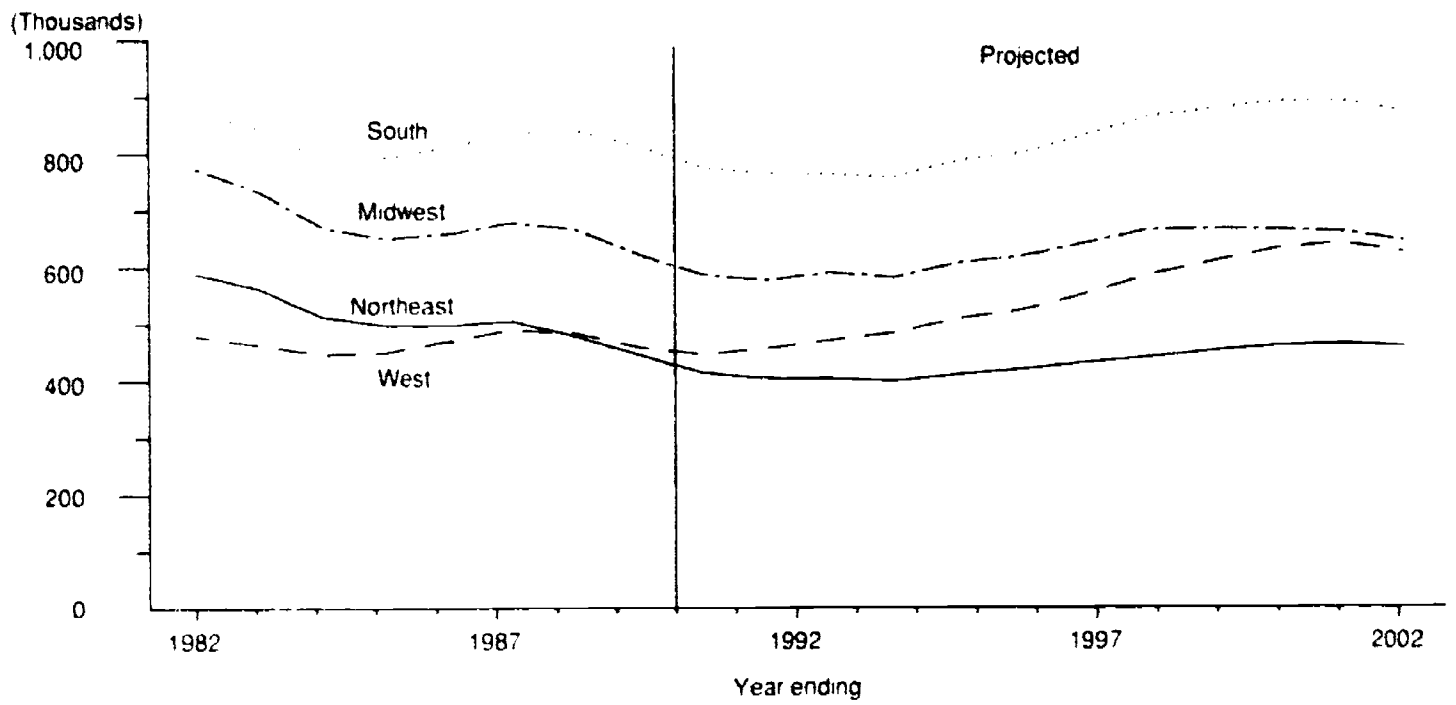


Figure 88

Percent change in number of public high school graduates, by state: 1989-90 to 2001-2002

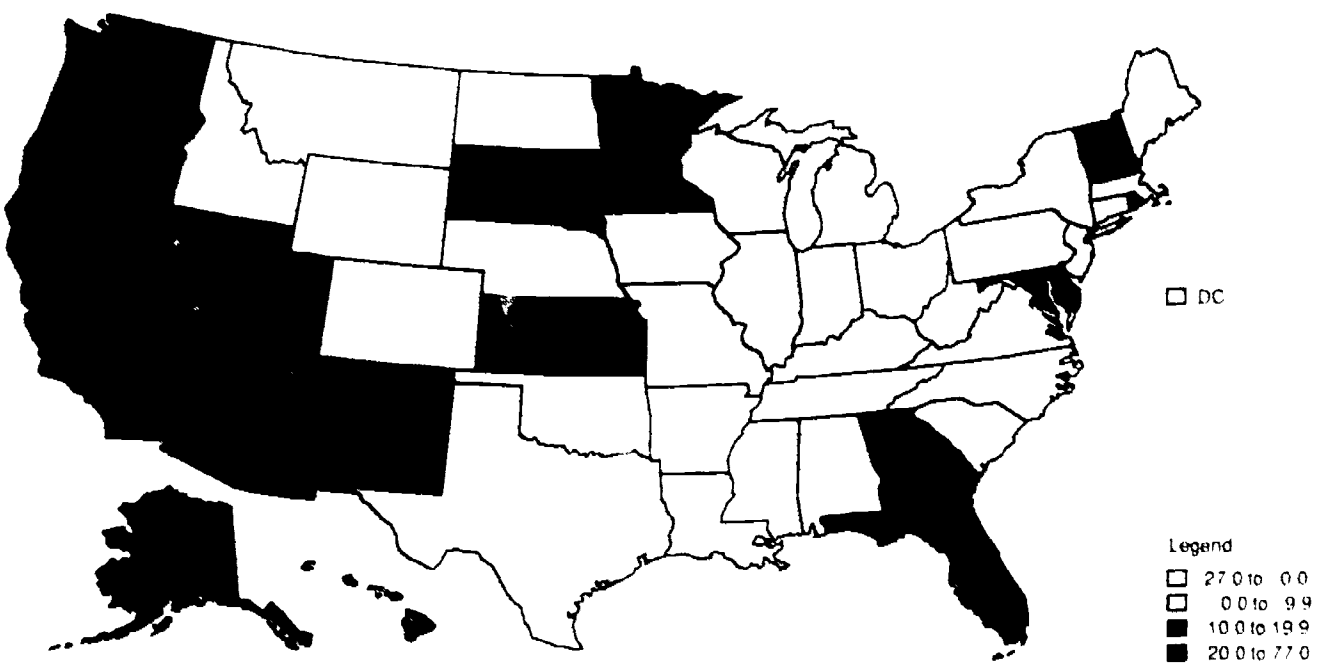


Figure 89

Percent change in number of public high school graduates, by state: Northeast, 1989-90 to 1995-96

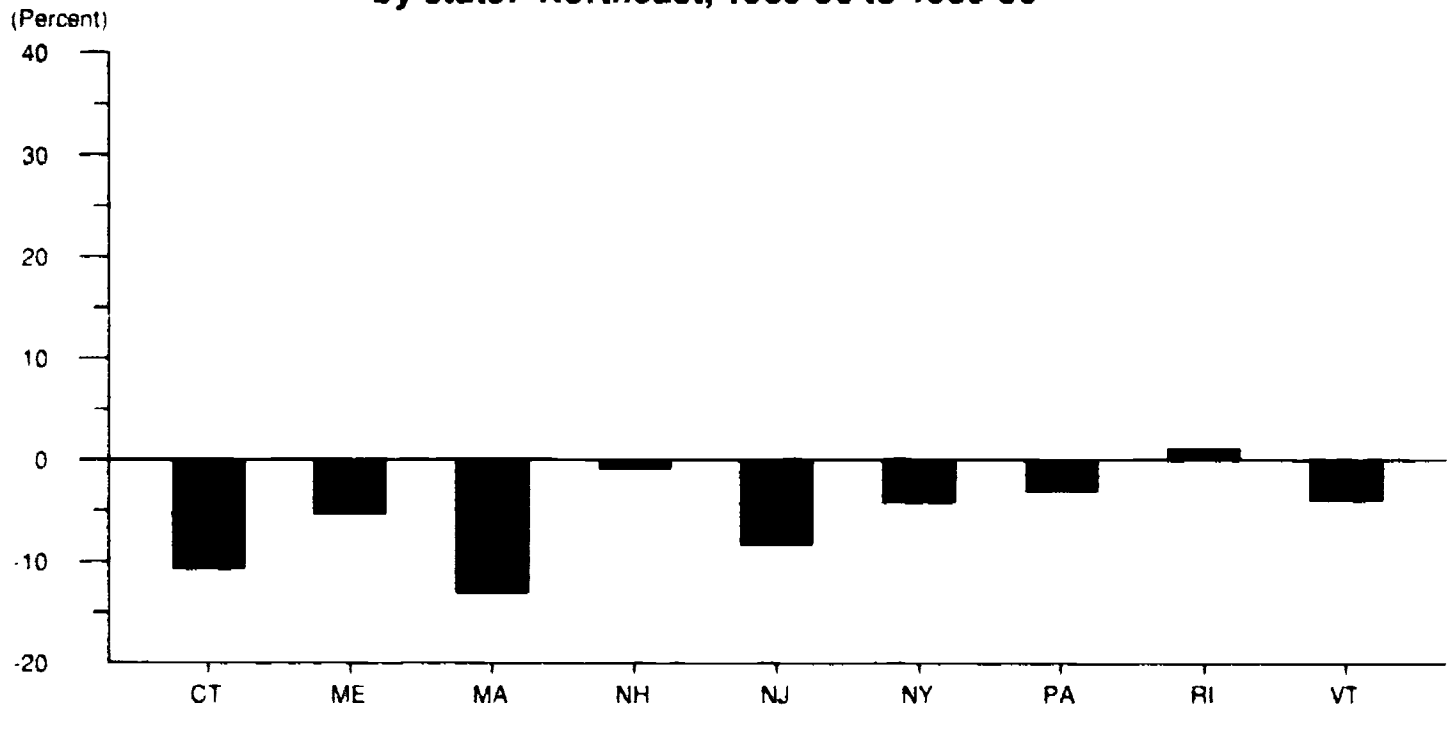


Figure 90

Percent change in number of public high school graduates, by state: Northeast, 1995-96 to 2001-2002

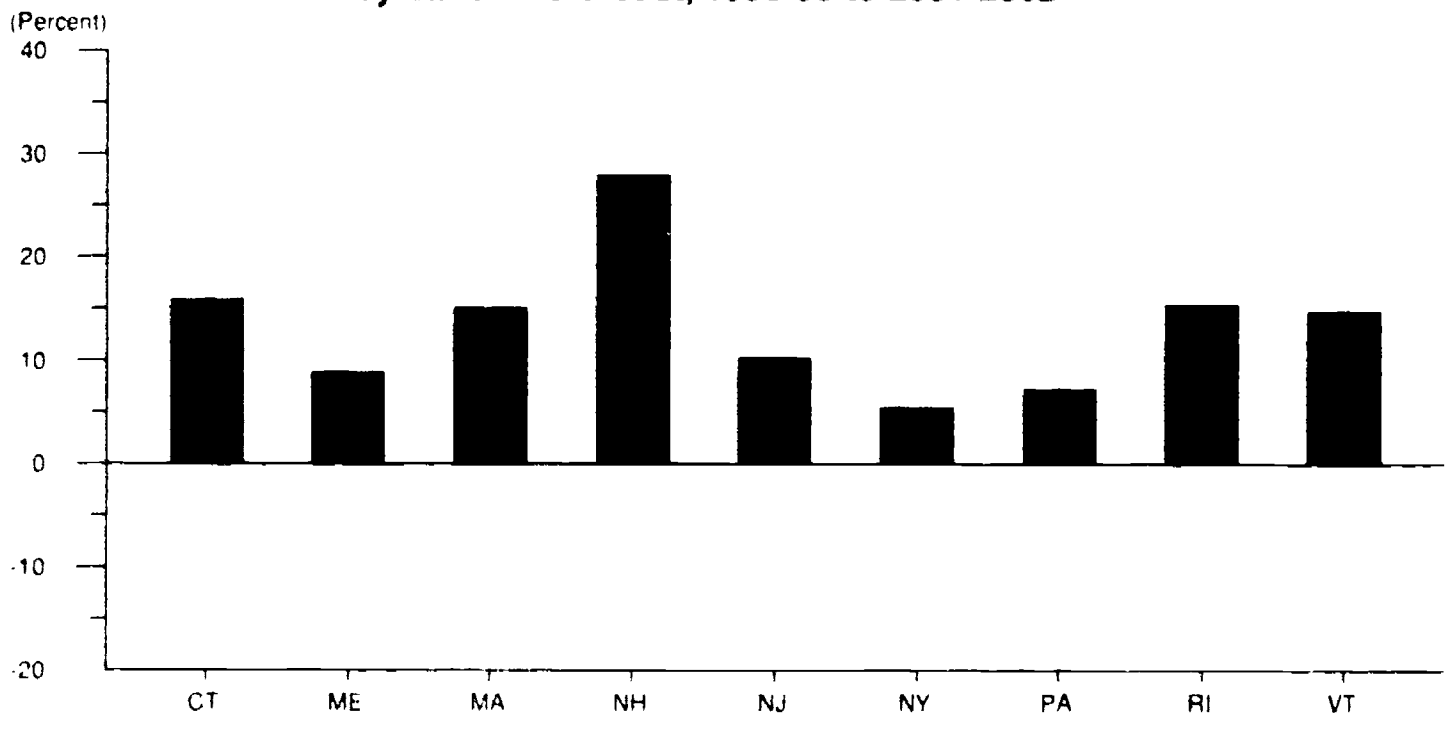


Figure 91

Percent change in number of public high school graduates, by state: Midwest, 1989-90 to 1995-96

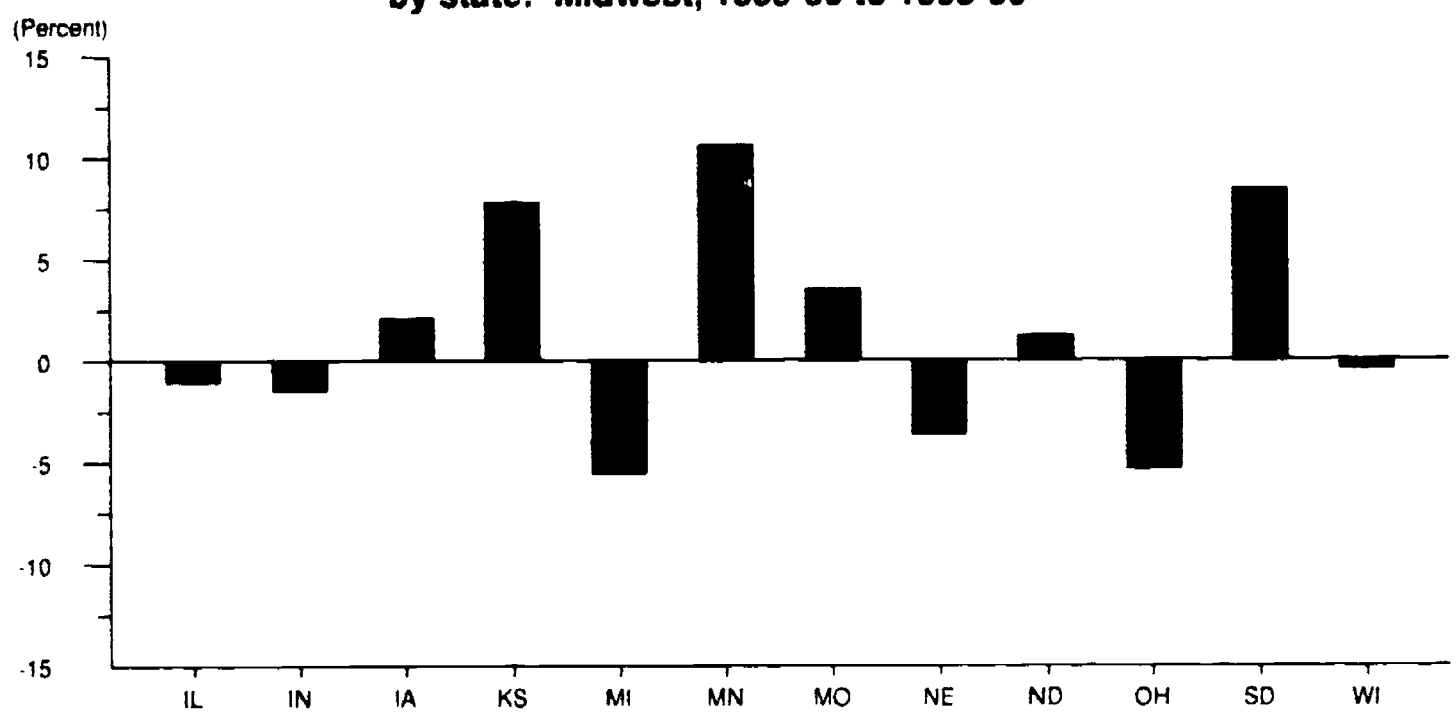


Figure 92

Percent change in number of public high school graduates, by state: Midwest, 1995-96 to 2001-2002

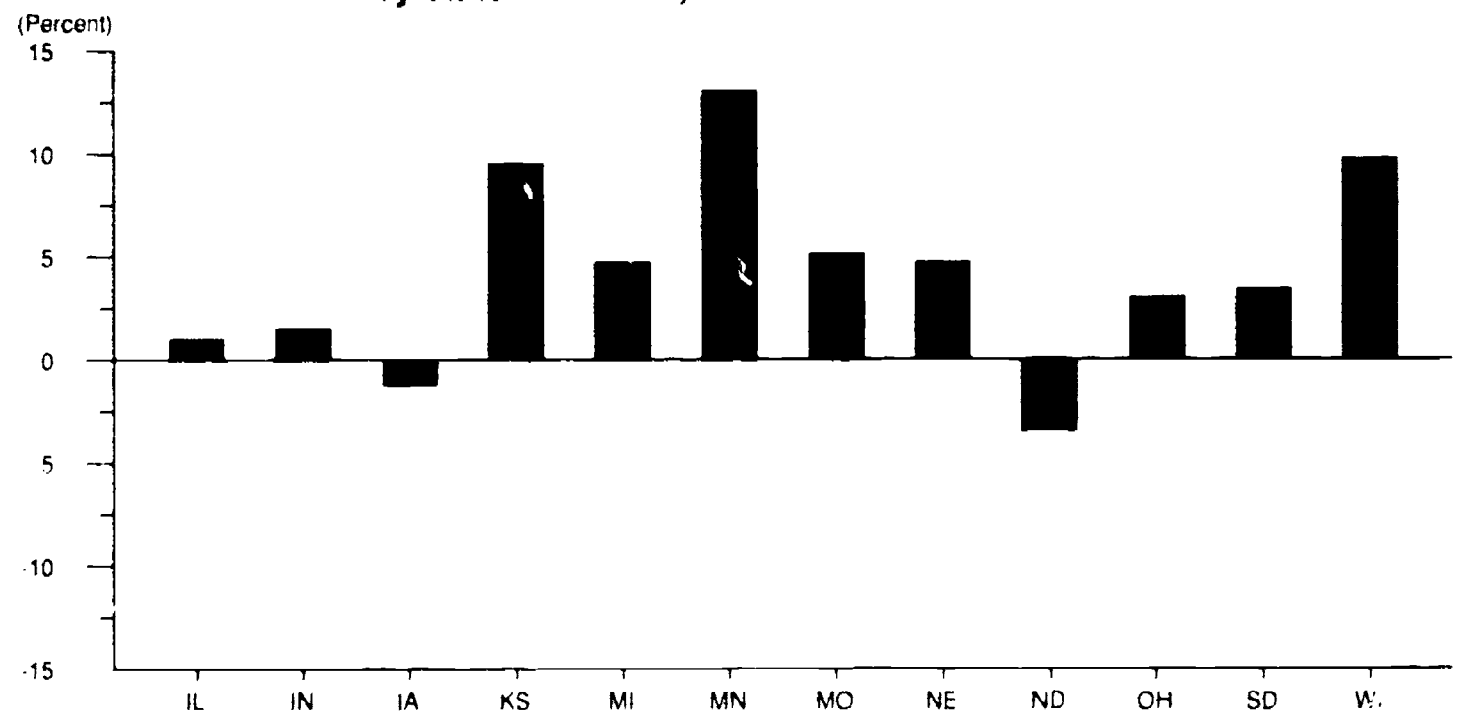


Figure 93

Percent change in number of public high school graduates, by state: South, 1989-90 to 1995-96

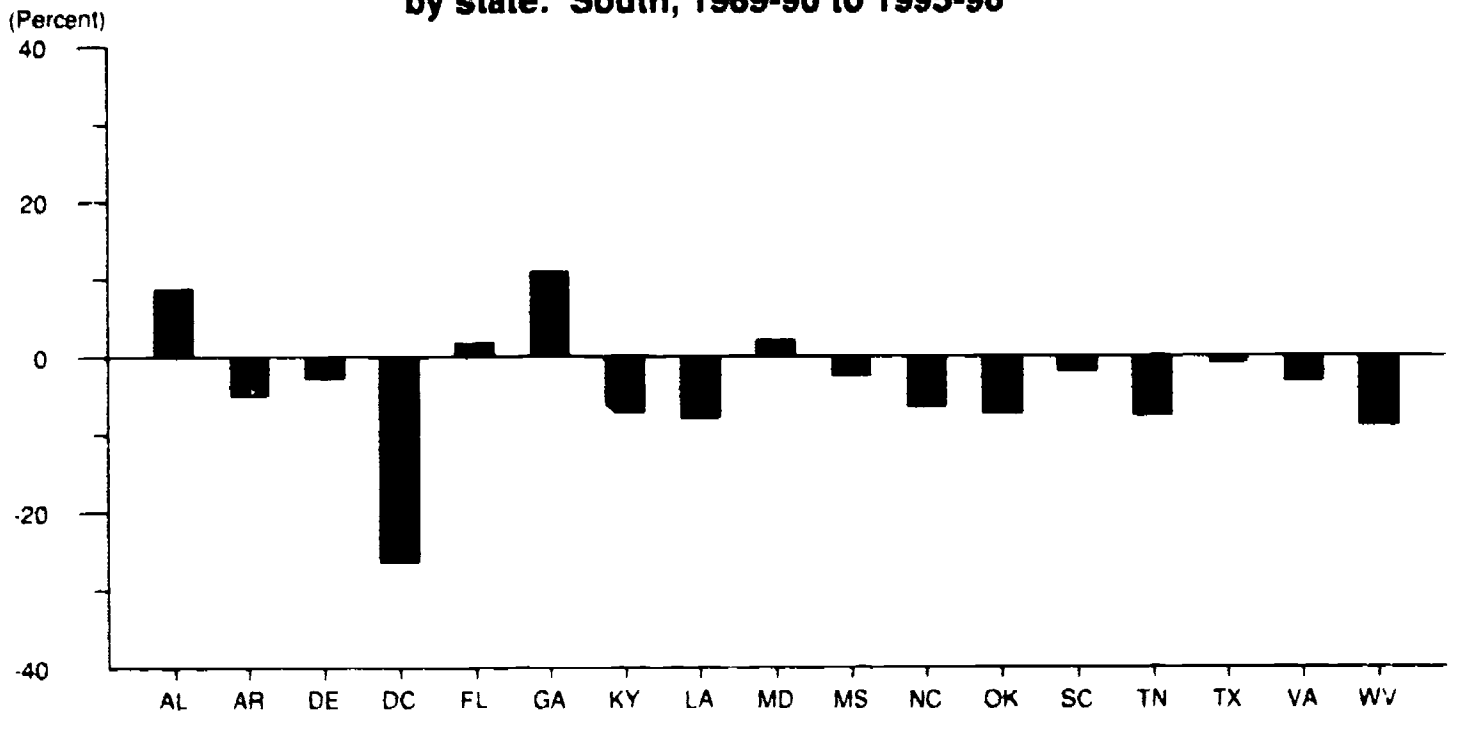


Figure 94

Percent change in number of public high school graduates, by state: South, 1995-96 to 2001-2002

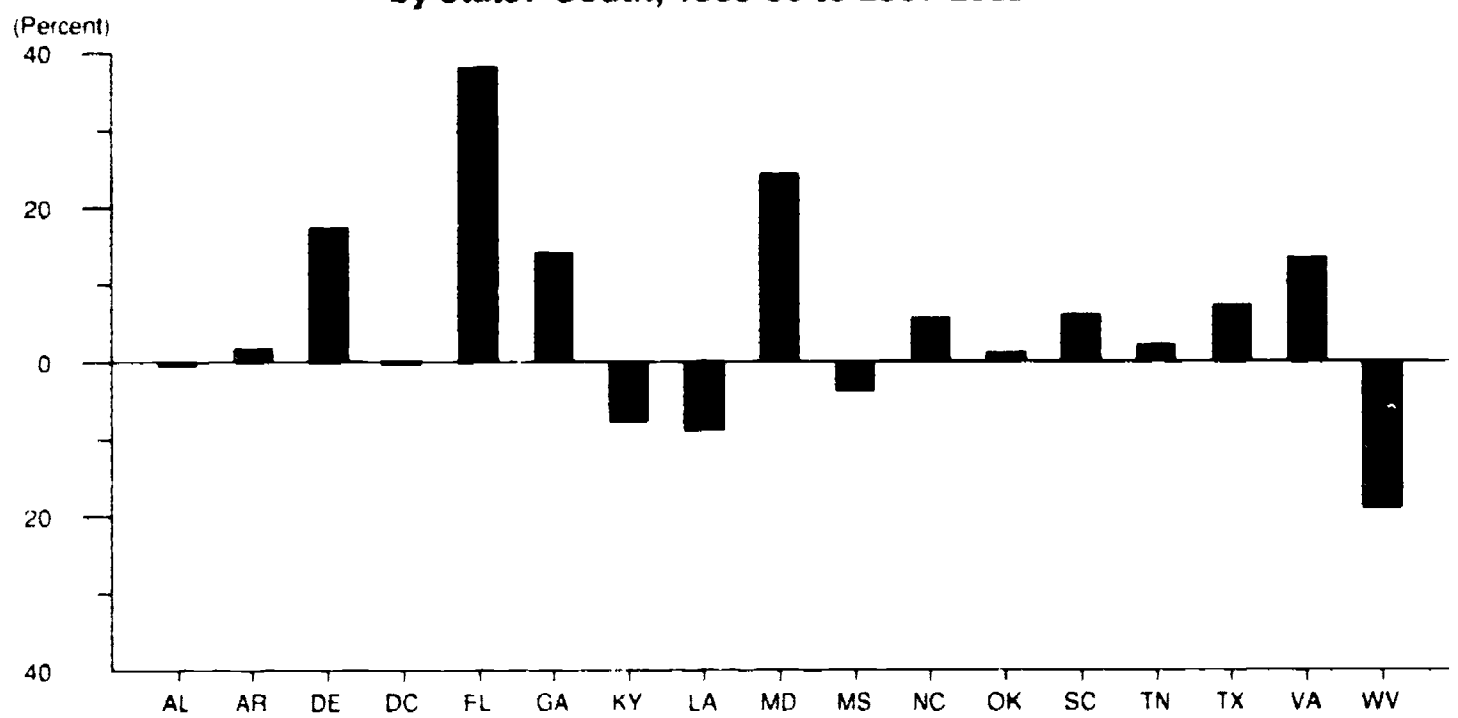


Figure 95

Percent change in number of public high school graduates, by state: West, 1989-90 to 1995-96

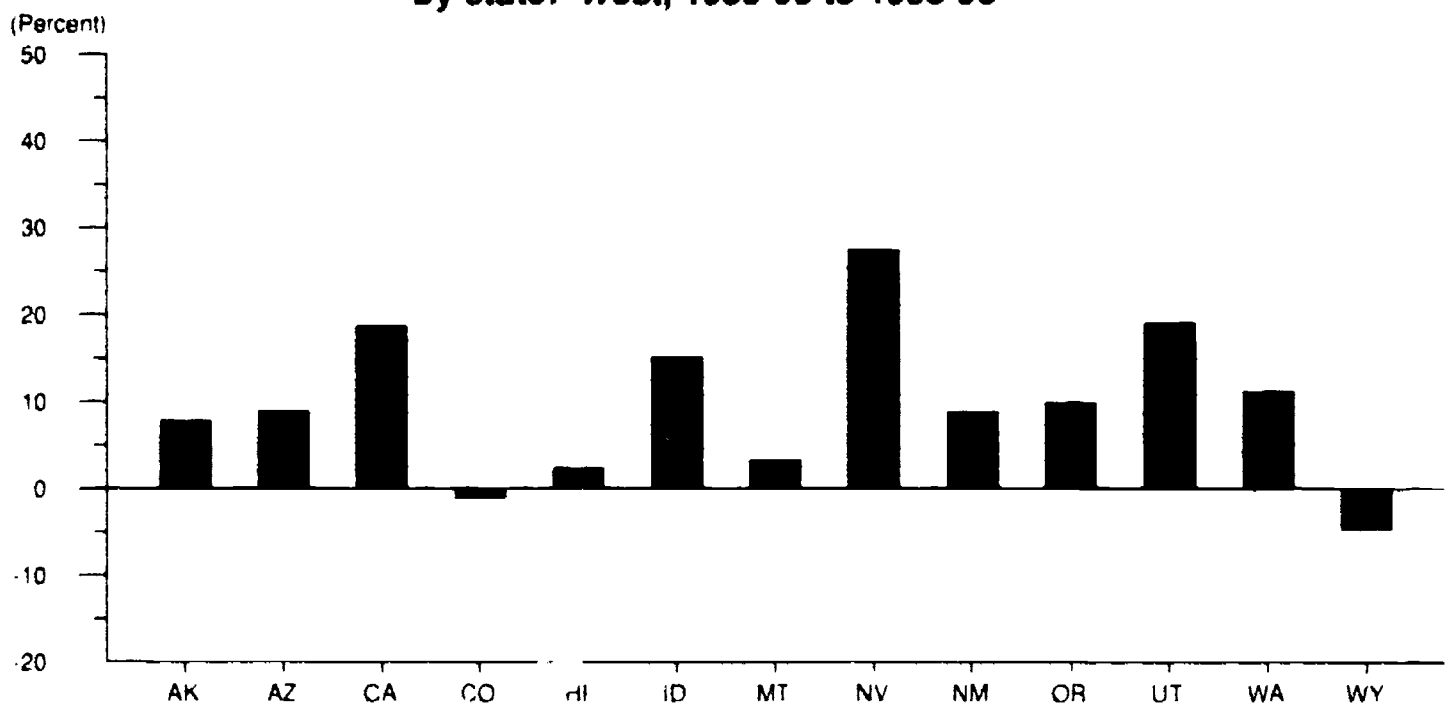


Figure 96

Percent change in number of public high school graduates, by state: West, 1995-96 to 2001-2002

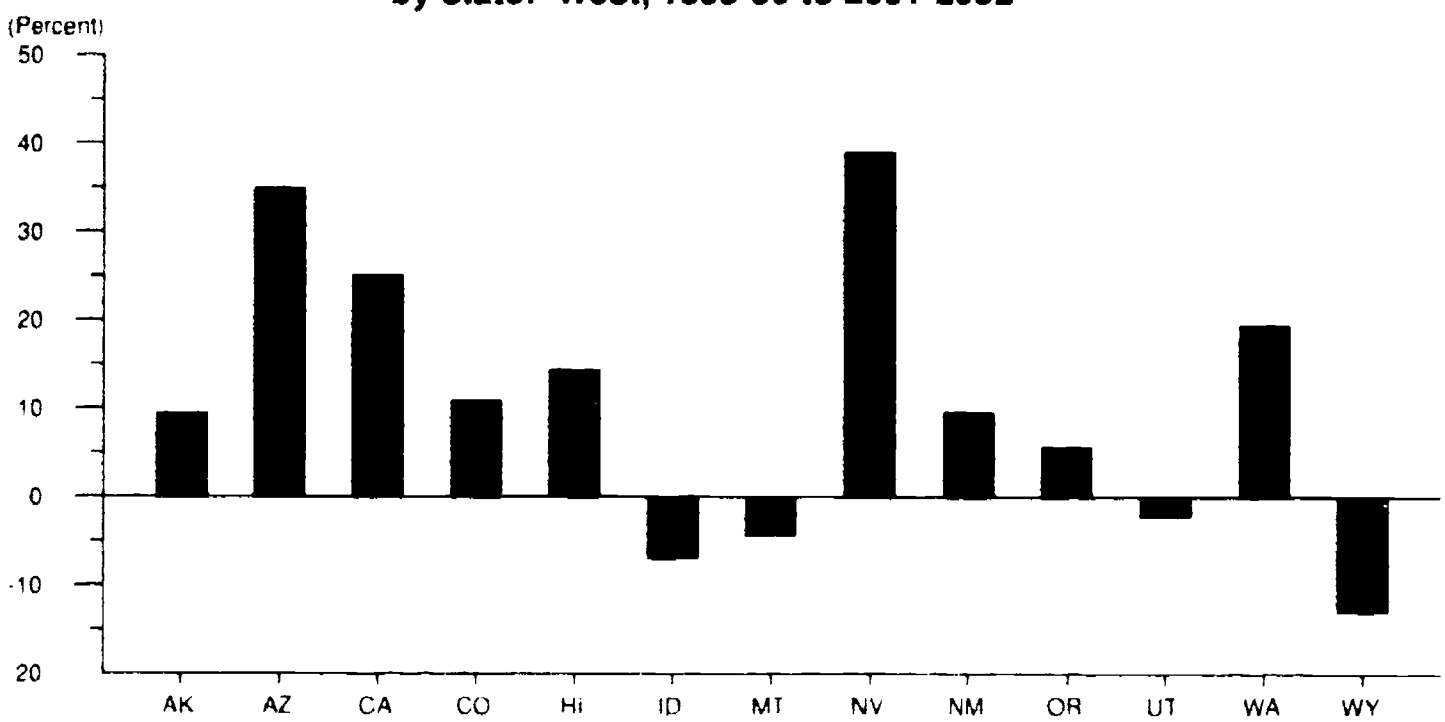


Table 43.—Number of high school graduates in public schools, by region and state, with projections: 1984–85 to 2001–2002

Region and state	Actual					Estimate	Projected		
	1984–85	1985–86	1986–87	1987–88	1988–89	1989–90	1990–91	1991–92	1992–93
United States	2,414,201	2,382,616	2,428,803	2,500,192	2,456,139	2,324,035	2,210,030	2,192,980	2,215,070
Northeast	511,189	496,104	495,738	503,042	475,232	442,511	411,120	402,300	401,490
Connecticut	32,126	33,571	31,141	32,383	30,862	30,000	26,160	25,950	25,670
Maine	13,924	13,006	13,692	13,808	13,857	13,323	12,460	12,220	12,280
Massachusetts	63,411	60,360	61,010	59,515	54,892	54,954	48,960	48,010	46,260
New Hampshire	11,052	10,648	10,796	11,685	11,340	10,357	9,680	9,660	9,440
New Jersey	81,147	78,781	79,376	80,863	76,263	68,445	64,700	62,970	62,070
New York	166,752	162,165	163,765	165,379	154,580	142,400	132,620	130,160	131,610
Pennsylvania	127,226	122,871	121,219	124,376	118,921	109,630	103,860	100,610	101,700
Rhode Island	9,382	8,908	8,771	8,856	8,554	7,708	7,490	7,530	7,280
Vermont	5,769	5,794	5,968	6,177	5,963	5,694	5,190	5,190	5,180
Midwest	668,475	647,462	657,067	675,571	663,225	617,784	583,380	574,230	586,180
Illinois	117,027	114,319	116,075	119,090	116,660	108,119	102,030	100,950	102,330
Indiana	63,308	59,817	60,364	64,037	63,571	59,415	56,870	54,450	56,790
Iowa	36,087	34,279	34,580	35,218	34,294	31,780	29,460	29,530	30,890
Kansas	25,983	25,587	26,933	27,036	26,848	25,108	24,540	24,320	25,160
Michigan	105,908	101,042	102,725	106,151	101,784	93,000	88,120	86,480	85,960
Minnesota	53,352	51,988	53,533	54,645	53,122	48,502	46,600	46,990	48,530
Missouri	51,290	49,204	50,840	51,316	51,968	48,457	46,480	46,090	46,930
Nebraska	18,036	17,845	18,129	18,300	18,698	18,556	16,510	16,760	17,390
North Dakota	8,146	7,610	7,821	8,432	8,077	7,698	7,640	7,400	7,470
Ohio	122,281	119,561	121,121	124,503	125,036	114,513	107,700	104,620	107,060
South Dakota	8,206	7,870	8,074	8,415	8,181	7,650	7,250	7,340	7,700
Wisconsin	58,851	58,340	56,872	58,428	54,994	54,994	50,180	49,300	49,970
South	789,445	790,924	807,348	833,532	836,564	802,843	771,190	761,490	758,820
Alabama	40,002	39,620	42,463	43,799	43,437	36,555	39,840	38,470	38,940
Arkansas	26,342	26,227	27,101	27,776	28,162	27,343	25,910	25,790	25,500
Delaware	5,893	5,791	5,895	5,963	6,104	6,111	5,220	5,290	5,440
District of Columbia	3,940	3,875	3,842	3,882	3,565	3,626	3,050	3,200	2,790
Florida	81,140	83,029	82,184	89,206	90,759	89,000	86,850	87,760	78,640
Georgia	58,654	59,082	60,018	61,765	61,937	56,605	57,460	57,320	58,580
Kentucky	37,989	37,288	36,948	39,484	38,883	38,693	34,760	33,080	34,080
Louisiana	39,742	39,965	39,084	39,058	37,198	35,899	34,570	33,090	33,600
Maryland	48,299	46,700	46,107	47,175	45,791	41,566	39,200	38,380	38,690
Mississippi	25,315	25,134	26,201	27,896	24,241	25,039	23,520	23,000	23,180
North Carolina	67,245	65,865	65,421	67,836	69,300	64,521	62,250	60,110	60,720
Oklahoma	34,626	34,452	35,514	36,145	36,773	35,606	32,270	32,310	30,300
South Carolina	34,500	34,500	36,000	36,113	37,020	34,600	33,390	32,630	33,130
Tennessee	43,293	43,263	44,731	47,904	48,553	47,500	43,720	43,480	43,710
Texas	159,234	161,150	168,430	171,436	176,951	182,057	169,700	169,950	174,660
Virginia	60,959	63,113	65,008	65,088	65,004	61,268	57,080	56,990	56,520
West Virginia	22,262	21,870	22,401	22,406	22,886	21,854	21,300	20,630	20,340
West	445,092	448,126	468,650	488,047	481,118	455,898	444,340	454,960	468,580
Alaska	5,184	5,464	5,692	5,907	5,631	5,432	5,260	5,270	5,260
Arizona	27,877	27,533	29,549	29,777	31,638	32,103	28,240	29,170	29,690
California	225,448	229,026	237,414	249,617	244,629	229,353	227,120	234,890	243,550
Colorado	32,255	32,621	34,200	35,977	35,520	32,967	31,340	30,400	31,400
Hawaii	10,092	9,958	10,371	10,575	10,404	9,905	9,567	9,180	9,490
Idaho	12,148	12,059	12,243	12,425	12,520	11,642	11,640	12,150	12,280
Montana	10,016	9,761	10,073	10,311	10,490	9,375	9,020	9,080	9,220
Nevada	8,572	8,784	9,506	9,404	9,464	9,462	9,270	9,560	9,890
New Mexico	15,622	15,468	15,701	15,868	15,381	14,884	14,770	15,130	15,400
Oregon	26,870	26,286	27,165	28,058	26,903	25,564	24,390	24,940	25,530
Utah	19,890	19,774	20,930	22,226	22,934	22,511	23,280	24,220	24,860
Washington	45,431	45,805	49,873	51,754	49,425	46,872	44,730	45,340	46,340
Wyoming	5,687	5,587	5,933	6,148	6,079	5,823	5,620	5,650	5,670

Table 43.—Number of high school graduates in public schools, by region and state, with projections: 1984–85 to 2001–2002—Continued

Region and state	Projected								
	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–2001	2001–2002
United States	2,209,050	2,298,020	2,345,000	2,438,040	2,538,020	2,587,040	2,629,030	2,639,040	2,583,990
Northeast	396,870	407,190	416,600	428,030	437,730	448,580	456,960	460,220	455,420
Connecticut	25,250	26,140	26,800	27,760	28,680	29,740	30,520	30,920	31,020
Maine	11,890	12,140	12,630	13,030	13,160	13,750	14,000	13,560	13,740
Massachusetts	45,650	46,770	47,800	49,140	51,000	52,730	54,190	54,330	54,970
New Hampshire	9,390	9,820	10,280	10,910	11,630	12,490	13,010	13,070	13,150
New Jersey	61,340	62,980	62,860	64,980	65,590	66,210	67,510	68,400	69,270
New York	131,370	133,890	136,580	139,130	140,590	143,260	145,860	146,650	143,970
Pennsylvania	99,540	102,600	106,390	109,280	112,670	115,510	116,650	117,520	114,050
Rhode Island	7,270	7,570	7,790	8,120	8,570	8,790	9,000	9,270	8,980
Vermont	5,170	5,360	5,470	5,680	5,840	6,100	6,220	6,500	6,270
Midwest	577,810	602,980	613,940	636,830	661,490	662,570	660,830	656,930	641,210
Illinois	102,740	106,690	107,020	111,840	116,370	112,470	110,840	108,560	108,110
Indiana	55,350	57,640	58,610	59,680	61,920	61,740	61,950	61,370	59,460
Iowa	30,570	31,870	32,440	33,400	34,830	35,080	34,150	33,840	32,040
Kansas	25,500	26,600	27,080	28,080	29,600	30,430	30,280	30,710	29,640
Michigan	83,340	86,100	87,870	90,390	92,300	92,980	93,900	93,690	92,910
Minnesota	48,660	51,060	53,630	56,200	59,550	61,580	62,590	62,540	60,610
Missouri	46,080	48,660	50,170	51,630	53,270	52,650	52,500	54,640	52,730
Nebraska	16,790	17,550	17,880	18,460	19,400	19,750	19,490	19,080	18,730
North Dakota	7,470	7,760	7,780	7,810	7,930	8,110	8,010	7,860	7,520
Ohio	104,290	107,660	108,400	113,120	116,920	117,340	116,480	114,040	111,700
South Dakota	7,920	8,210	8,290	8,670	8,980	9,040	8,990	8,550	8,570
Wisconsin	49,080	53,190	54,770	57,550	60,410	61,400	61,650	62,130	60,080
South	753,420	781,780	795,010	825,220	857,650	871,550	883,770	884,920	867,080
Alabama	38,330	39,490	39,750	40,510	42,030	41,040	40,640	39,790	39,540
Arkansas	25,460	26,160	26,080	26,920	27,580	27,370	27,110	26,780	26,450
Delaware	5,450	5,710	5,950	6,450	6,730	7,140	7,100	6,970	6,970
District of Columbia	2,730	2,640	2,670	2,700	2,620	2,660	2,580	2,540	2,670
Florida	84,000	86,960	90,490	98,330	105,810	113,220	121,100	126,590	124,940
Georgia	58,080	60,420	62,760	66,110	70,600	72,460	71,540	71,440	71,540
Kentucky	34,100	35,920	35,930	36,480	37,180	36,330	35,680	34,610	33,170
Louisiana	32,260	32,840	33,120	33,220	33,160	32,570	32,010	30,670	30,190
Maryland	38,390	41,230	42,440	44,520	47,080	48,860	51,250	51,680	52,730
Mississippi	23,110	24,570	24,430	24,740	25,620	25,870	25,450	24,370	23,520
North Carolina	57,940	60,070	60,380	61,670	63,070	63,530	64,260	64,440	63,790
Oklahoma	31,510	32,750	33,000	33,720	34,990	35,430	36,100	36,530	33,360
South Carolina	31,870	33,530	33,980	35,240	36,600	36,940	37,390	37,050	36,020
Tennessee	41,760	43,620	43,960	45,010	45,340	45,910	46,810	46,380	44,870
Texas	172,930	177,240	180,840	187,930	195,950	198,650	200,390	201,970	193,850
Virginia	55,610	58,160	59,370	61,780	63,830	64,670	65,920	65,650	67,250
West Virginia	19,880	20,510	19,930	18,850	19,460	18,900	18,440	17,460	16,140
West	480,950	506,060	519,450	547,960	581,150	604,340	627,470	636,970	620,360
Alaska	5,490	5,690	5,860	6,030	6,320	6,600	6,670	6,200	6,410
Arizona	31,190	33,590	34,930	38,400	41,340	43,430	46,590	48,570	47,120
California	249,860	263,060	272,110	285,780	307,110	323,390	337,520	346,890	340,070
Colorado	31,310	31,920	32,640	34,260	35,710	36,810	37,540	37,360	36,170
Hawaii	9,860	10,090	10,130	10,480	10,970	11,130	11,400	11,530	11,580
Idaho	12,620	13,060	13,380	13,780	13,850	13,610	13,690	13,220	12,460
Montana	9,310	9,570	9,680	9,660	9,960	9,990	9,870	9,650	9,260
Nevada	10,500	11,440	12,080	13,300	14,700	15,740	16,760	17,490	16,740
New Mexico	15,170	15,710	16,170	16,500	17,450	17,880	18,080	18,210	17,710
Oregon	26,340	27,430	28,070	29,080	29,060	29,860	31,240	31,000	29,650
Utah	26,950	28,220	26,800	29,290	30,100	29,130	29,230	27,660	26,181
Washington	46,860	50,590	52,080	55,470	58,620	61,130	63,230	63,660	62,170
Wyoming	5,490	5,690	5,550	5,930	5,960	5,640	5,650	5,520	4,840

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys and "Key Statistics for Public and Private Elementary and Secondary Education School Year 1990–1991," *Early Estimates*. (This table was prepared June 1991.)

Table 44.—Percent change in number of public high school graduates, by region and state, with projections: 1984–85 to 2001–2002

Region and state	Actual	Projected		
	1984–85 to 1989–90	1989–90 to 1995–96	1995–96 to 2001–2002	1989–90 to 2001–2002
United States	3.7	0.9	10.2	11.2
Northeast	13.4	5.9	9.3	2.9
Connecticut	6.6	10.7	15.8	3.4
Maine	-4.3	5.2	8.8	3.2
Massachusetts	13.3	-13.0	15.0	0.0
New Hampshire	6.3	0.8	27.9	26.9
New Jersey	16.1	8.2	10.2	1.2
New York	14.6	4.1	5.4	1.1
Pennsylvania	13.8	3.0	7.2	4.0
Rhode Island	-16.2	1.1	15.3	16.5
Vermont	-1.3	3.9	14.7	10.2
Midwest	7.6	0.6	4.4	3.8
Illinois	7.6	1.0	1.0	-0.0
Indiana	6.1	-1.4	1.5	0.1
Iowa	11.9	2.1	-1.2	0.8
Kansas	3.4	7.8	9.5	18.1
Michigan	12.2	-5.5	4.7	-1.1
Minnesota	-9.1	10.6	13.0	25.0
Missouri	5.5	3.5	5.1	8.8
Nebraska	2.9	-3.6	4.7	0.9
North Dakota	5.6	1.2	3.4	-2.3
Ohio	6.4	-5.3	3.0	-2.5
South Dakota	-6.8	8.4	3.4	12.1
Wisconsin	6.6	-0.4	9.7	9.3
South	2.3	1.6	9.1	7.3
Alabama	-8.6	8.7	-0.5	8.2
Arkansas	3.8	4.9	1.7	-3.3
Delaware	3.7	2.7	17.3	14.1
District of Columbia	8.0	-26.3	-0.0	-26.3
Florida	9.7	1.7	38.1	40.4
Georgia	3.5	10.9	14.0	26.4
Kentucky	1.8	7.1	-7.7	-14.3
Louisiana	0.7	7.8	-8.8	-15.9
Maryland	13.9	2.1	24.2	26.9
Mississippi	1.1	-2.4	3.8	-6.1
North Carolina	4.1	6.4	5.6	-1.1
Oklahoma	2.8	7.3	1.1	-6.3
South Carolina	0.3	1.8	6.0	4.1
Tennessee	9.7	7.5	2.1	-5.5
Texas	14.3	-0.7	7.2	6.5
Virginia	0.5	3.1	13.3	9.8
West Virginia	1.8	8.8	19.0	-26.1
West	2.4	13.9	19.4	36.1
Alaska	4.9	7.7	9.4	17.9
Arizona	15.2	8.8	34.9	46.8
California	2.7	18.6	25.0	48.3
Colorado	2.2	1.0	10.8	9.7
Hawaii	1.9	2.3	14.3	16.9
Idaho	4.2	15.0	6.9	7.0
Montana	6.4	3.2	4.3	-1.2
Nevada	10.4	27.3	38.9	76.9
New Mexico	4.7	8.7	9.8	19.0
Oregon	4.9	9.8	5.6	16.0
Utah	13.2	19.0	2.2	16.4
Washington	3.2	11.1	19.4	32.6
Wyoming	2.4	4.6	12.9	16.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data surveys and "Key Statistics for Public and Private Elementary and Secondary Education: School Year 1990–91," *Early Estimates*. (This table was prepared June 1991.)

New Developments in Projecting Education Statistics

Chapter 9

Higher Education Enrollment, by Race/Ethnicity

Beginning with this edition of *Projections*, a section on new developments in projecting education statistics is included in this report. Its purpose is to acquaint users of projections with recent efforts to project education statistics not previously published by the National Center for Education Statistics. This section presents projections of higher education enrollment by sex and race/ethnicity to the year 2000. Projections of higher education enrollment by sex were developed for the following groups: white, non-Hispanic; black, non-Hispanic; Hispanic; Asian or Pacific islander; American Indian/Alaskan Native; and nonresident alien. The projections by race/ethnicity were adjusted to agree with the middle alternative projections shown in table 3. These projections are preliminary. Research is underway to determine a link between social and economic conditions and participation in higher education.

Total

Total enrollment in institutions of higher education is projected to increase from an estimated 13.9 million in 1990 to 15.7 million in the year 2000, an increase of 13 percent (table 3). This is less than the 15-percent increase that occurred between 1980 and 1990. The number of women enrolled in college will continue to surpass the enrollment of men. Between 1990 and the year 2000, the enrollment of women is expected to increase from 7.5 million to 8.8 million, a 17-percent increase. This is less than the 21-percent increase experienced between 1980 and 1990. A smaller increase is projected for enrollment of men. This number will increase by 8 percent, from 6.5 million in 1990 to 6.9 million by the year 2000. This compares with a 9-percent increase between 1980 and 1990.

Race/Ethnicity

By race/ethnicity, enrollment in institutions of higher education will vary across groups. Between 1990 and the year 2000, the enrollments of Asians or Pacific Islanders and Hispanics are projected to grow faster than the enrollments of non-Hispanic whites and non-Hispanic blacks. The number of black college students is projected to increase at a faster rate than the number of whites college students. Across racial groups, with the exception of Asians or Pacific Islanders, the enrollment of women will increase faster than the enrollment of their male counterparts.

Between 1990 and the year 2000, the enrollment of whites is projected to increase from an estimated 10.8 million to 11.6 million, an increase of 8 percent (table 45 and figure 97). This increase in enrollment is slightly smaller than the 9-percent increase that occurred between 1980 and 1990. The enrollment of blacks increased from 1.1 million in 1980 to 1.3 million in 1990, a 15-percent increase. By the year 2000, this number is projected to increase to 1.5 millio· an increase of 19 percent. The enrollment of Hispanics rose by 50 percent between 1980 and 1990, from 472,000 to 707,000. By the year 2000, this number is expected to increase to 1.0 million, an increase of 43 percent. This is the largest increase among all groups. Asians or Pacific Islanders are projected to have the second largest increase in college enrollment. Over the projection period, their numbers will increase from 717,000 in 1990 to 986,000 by the year 2000, an increase of 38 percent (table 46). This increase is less t... ...e 83-percent increase in enrollment between 1980 and 1990. The enrollemnt of American Indians/Alaskan Natives is projected to increase from 98,000 in 1990 to 110,000 in 2000, an increase of 12 percent. This increase is smaller than the 17-percent increase in enrollment experienced by this group between 1980 and 1990. The enrollment of nonresident aliens, which increased by 26 percent from 305,000 in 1980 to an estimated 386,000 in 1990, is projected to increase to 428,000 by the year 2000, an 11-percent increase from 1990.

Sex

As mentioned earlier, with the exception of Asians or Pacific Islanders, the enrollment of women will increase faster than that of men between 1990 and 2000. For whites, the enrollment of women is projected to grow by 12 percent, while the enrollment of men will increase by a moderate 3 percent (figures 98 and 99). Over the projection period, the enrollment of black women will rise by 24 percent, twice the 12-percent increase experienced between 1980 and 1990, while the enrollment of black men is expected to increase by 13 percent. For Hispanics, the enrollment of women is projected to increase by 51

percent between 1980 and 2000; the enrollment of men is projected to increase by 35 percent. In contrast, among Asians or Pacific Islanders, the enrollment of men is projected to increase faster than that of women over the projection period, 41 percent versus 35 percent. Among American Indians/Alaskan Natives, the enrollment of women is expected to rise by 16 percent, while the enrollment of men is projected to increase by 7 percent. Among nonresident aliens, the number of women enrolled is projected to increase by 17 percent between 1990 and 2000, versus 8 percent for men.

Methodology

The projections of higher education enrollment by race/ethnicity and sex were developed using enrollment and population data for 1974 to 1989 available from the *Current Population Reports* of the Bureau of the Census. Series 18 population projections were used to develop the enrollment projections. This series assumes high fertility and high immigration over the projection period. In addition, enrollment data for 1976 to 1988 from the Integrated Postsecondary Education Data System (IPEDS) of the National Center for Education Statistics were used. Using enrollment and population data from the Bureau of the Census, enrollment rates by age and sex were calculated for the following groups: white, non-Hispanic; black, non-Hispanic; Hispanic; and other races. For each sex, enrollment rates were calculated for individual ages 16 through 24 and for the age groups 25-29, 30-34, and 35 years old and over. Only the rates for non-Hispanic white, non Hispanic black, and Hispanic groups were fairly useable, because there were eventually severe modeling problems. Enrollments of the other races and nonresident aliens were projected directly from data supplied by IPEDS. For Asians or Pacific Islanders, American Indians/Alaskan Natives, and nonresident aliens, the proportion that each group was of total college enrollment was calculated. Three forecasting techniques were used to project the enrollment rates and proportions. These included single and double exponential smoothing methods and multiple linear regression. For a discussion of exponential smoothing methods, see appendix A, Projection Methodology. For the regression models, enrollment rates were modeled as a function of unemployment rates for young adults, disposable income, and a change in student financial assistance from a variety of sources. The results were unusable. This is most likely due to data problems and the difficulty associated with linking economic and policy variables to participation in higher education. The exponential smoothing models were selected to project both the enrollment rates and proportions of college enrollment.

Assumptions

The projections for white men assume that enrollment rates of 18-, 19-, 22-, and 35-year-olds enrolled full-time will increase over the projection period. The enrollment rates for the remaining individual ages and age groups will remain at levels consistent with the most recent rates. For black men, their full-time enrollment rates will remain at levels consistent with most recent rates. Enrollment rates for Hispanic men enrolled full-time will remain constant at levels consistent with most recent rates for most of the ages, decrease for 25- to 29-year-olds, and increase for those 35 years old and over. For men, enrollment rates of whites, blacks, and Hispanics enrolled part-time are projected to remain constant at levels consistent with the most recent rates, with the exception of the enrollment rate of 30- to -34-year-old blacks, which is expected to decline.

The full-time enrollment rates of white women are projected to increase for 18-, 19-, 20-, and 30- to 34-year-olds, and those 35 years old and over. The remaining rates are projected to remain constant at levels consistent with the most recent rates. For black women and Hispanic women enrolled full-time, their enrollment rates are projected to remain constant at levels consistent with the most recent rates. Enrollment rates of white women and Hispanic women enrolled part-time are projected to remain constant at rates consistent with the most recent levels. Similarly, part-time enrollment rates for black women are expected to remain constant at the most recent levels, with the exception of the enrollment rate for 21-year-olds, which is projected to increase over the projection period.

These projected enrollment rates were then applied to population projections by sex and race/ethnicity available from the Bureau of the Census to yield projections of enrollment by sex and race/ethnicity. A few of the enrollment rates were projected to increase or decrease over the period. Most of the rates will remain at levels around their 1989 rates. Therefore, enrollment increases and decreases reflect the strong effects of demographic changes in the populations by race/ethnicity as projected by the Bureau of the Census.

As noted, Asians or Pacific Islanders, American Indians/Alaskan Natives, and nonresident aliens were projected as proportions of total enrollment. The proportion for Asians and Pacific Islanders by sex was projected to increase over the projection period, based on past trends. The proportion for American Indians/Alaskan Natives was projected to remain constant at a level consistent with the most recent rates, given that this proportion has remained fairly constant historically. It was assumed that the proportion for nonresident aliens by sex will remain constant over the projection period at its 1989 level. These projected proportions were then applied to the middle alternative projections shown in table 3 to develop projections of enrollment for these specific groups.

The individual projections by race/ethnicity and sex were summed and adjusted to agree with the independently developed middle alternative projections of total enrollment in higher education shown in table 3. Since these two sets of projections were based on slightly different assumptions, the resultant projections of enrollment by sex and race/ethnicity shown in this chapter implicitly incorporate some of these assumptions as stated in chapter 2.

Caveats

Projections of time series usually differ from the reported data due to errors from many sources. This is because of the data variability inherent in the statistical universes from which the data are derived and the choice of projection methodologies used to develop the projections. The projections presented here are to be considered preliminary. They warrant further evaluation and ongoing research to study the link between social and economic conditions and participation in higher education. However, these projections are consistent with available population trends.

For historical enrollment numbers appearing in tables 45 and 46, the sum of the various enrollments by race/ethnicity is slightly lower than the total enrollment shown in tables 3 and 9 because of underreporting of racial/ethnic data.

Figure 97

Percent change in higher education enrollment, by race/ethnicity: 1980-1990 and 1990-2000

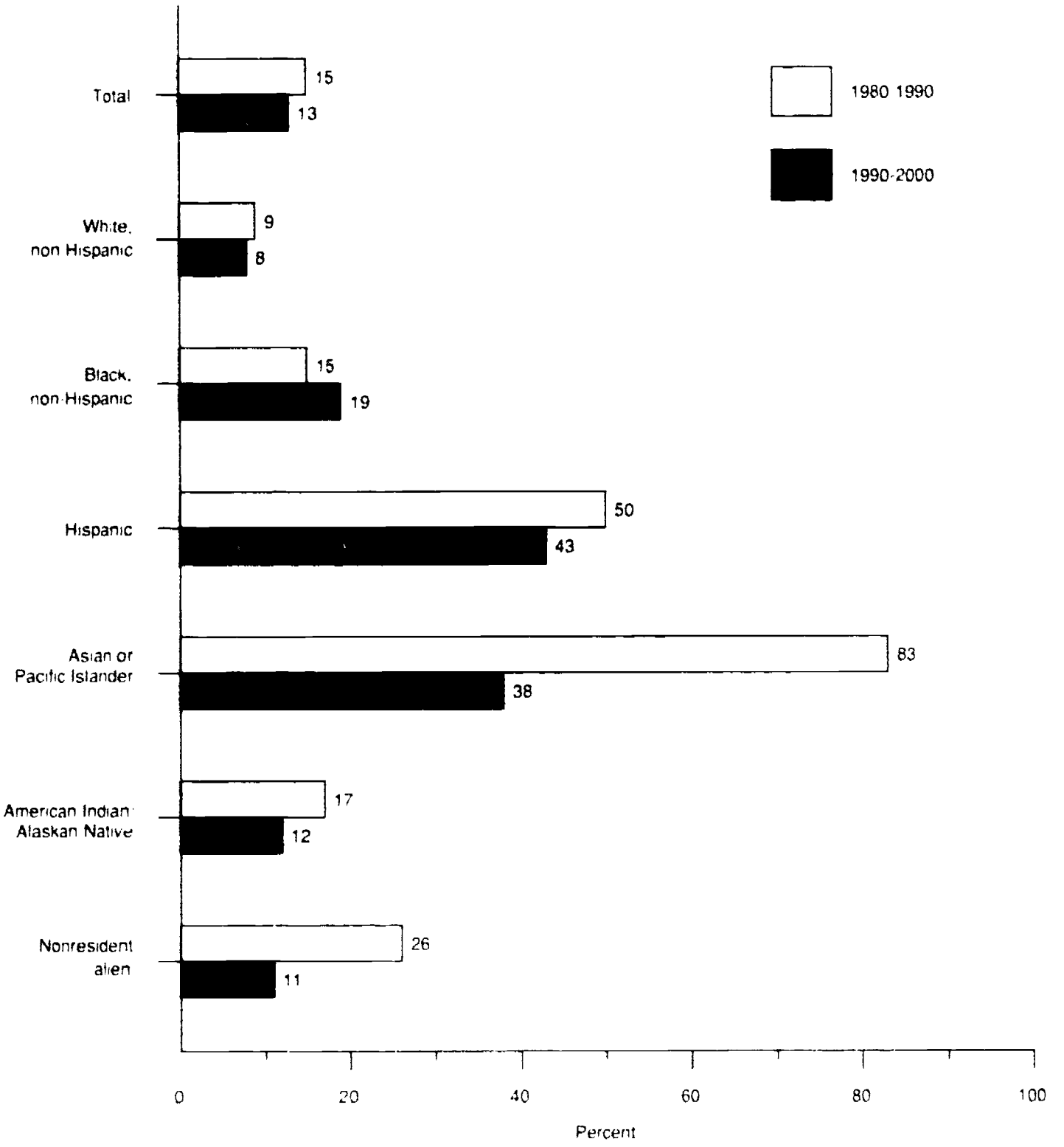


Figure 98

Percent change in higher education enrollment of men, by race/ethnicity: 1980-1990 and 1990-2000

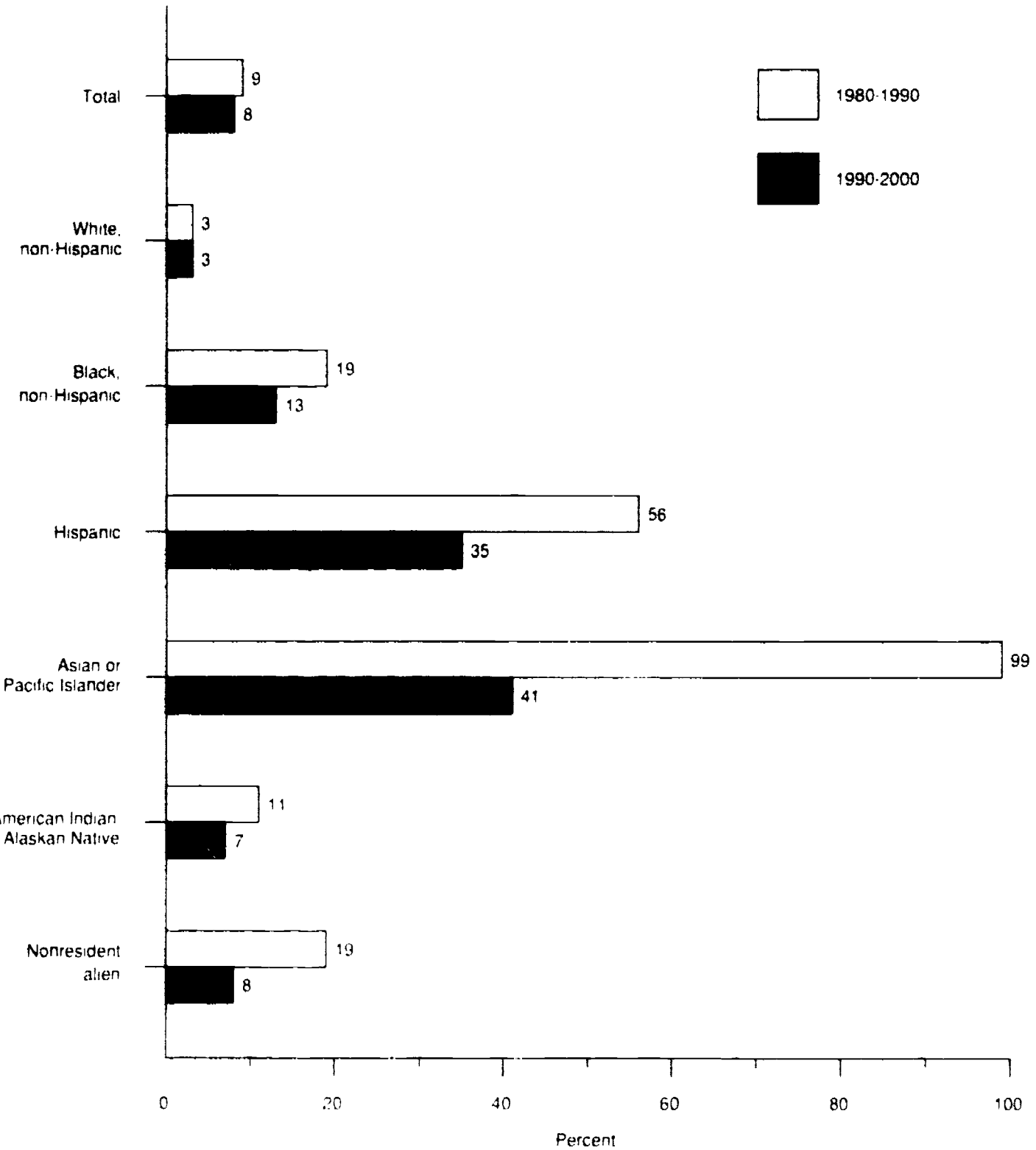


Figure 99

Percent change in higher education enrollment of women, by race/ethnicity: 1980-1990 and 1990-2000

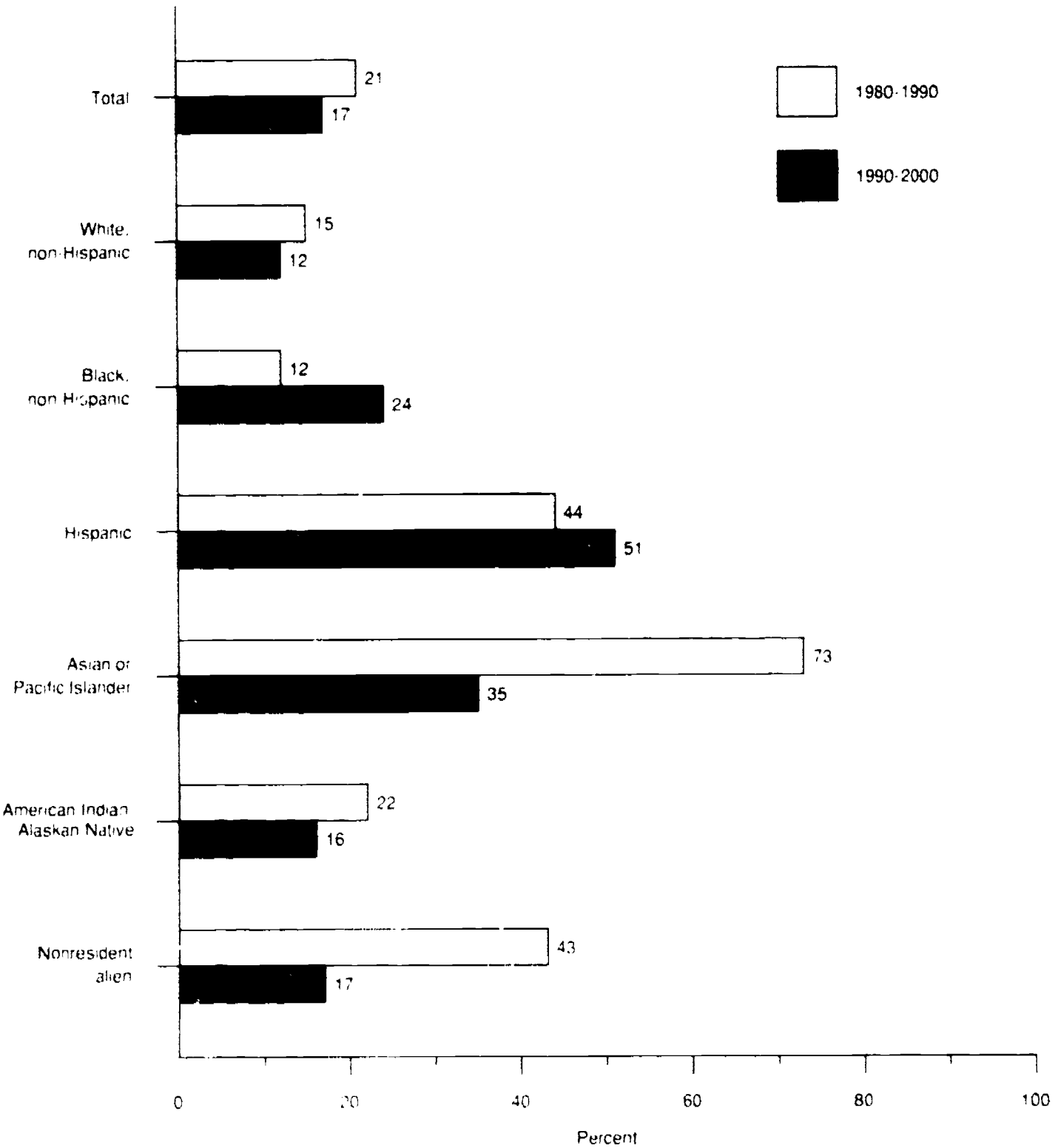


Table 45.—Enrollment in institutions of higher education, by race/ethnicity and sex, with projections (white, non-Hispanic; black, non-Hispanic; and Hispanic): 50 States and D.C., fall 1976 to fall 2000

(In thousands)

Year	White, non-Hispanic			Black, non-Hispanic			Hispanic		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
1976	9,076	4,814	4,262	1,033	470	563	384	210	174
1978	9,194	4,613	4,581	1,054	453	601	417	212	205
1980	9,833	4,773	5,060	1,107	464	643	472	232	240
1982	9,997	4,830	5,167	1,102	458	644	520	252	268
1984	9,814	4,690	5,124	1,076	437	639	535	254	281
1986	9,921	4,647	5,274	1,082	436	646	618	290	328
1988	10,284	4,712	5,572	1,130	443	687	680	310	370
1990[1]	10,750	4,910	5,840	1,274	553	721	707	362	345
					Projected				
1991	10,826	4,919	5,907	1,289	559	730	731	374	357
1992	10,757	4,870	5,887	1,367	592	775	794	406	388
1993	10,889	4,895	5,994	1,318	566	752	786	398	388
1994	10,838	4,818	6,021	1,402	598	803	859	433	426
1995	11,020	4,885	6,135	1,330	568	771	839	419	420
1996	11,019	4,878	6,140	1,431	604	827	913	455	458
1997	11,259	4,967	6,292	1,376	573	802	887	436	451
1998	11,310	4,965	6,345	1,478	615	862	961	472	489
1999	11,476	5,019	6,457	1,409	622	817	984	479	504
2000	11,637	5,069	6,568	1,521	627	895	1,010	488	522

[1] Projected.

NOTE: Projections are based on data through 1989 and have been adjusted to sum to the middle alternative projections of higher education enrollment by sex shown in table 3. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "United States Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1980 to 1988," *Current Population Reports*, Series P-25, No. 1045, January 1990; "U.S. Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1989," *Current Population Reports*, Series P-25, No. 1057, March 1990; "Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080," *Current Population Reports*, Series P-25, No. 1018, January 1989; and "Projections of the Hispanic Population: 1983 to 2080," *Current Population Reports*, Series P-25, No. 995, November 1986; and U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in Colleges and Universities, Integrated Postsecondary Education Data System (IPEDS) surveys, and unpublished tabulations. (This table was prepared June 1991.)

Table 46.—Enrollment in institutions of higher education, by race/ethnicity and sex, with projections (Asian or Pacific Islander, American Indian/Alaskan Native, and Nonresident alien): 50 States and D.C., fall 1976 to fall 2000

(In thousands)

Year	Asian or Pacific Islander			American Indian/ Alaskan Native			Nonresident alien		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
1976	282	108	174	76	38	38	219	154	65
1978	331	126	205	78	37	41	253	180	73
1980	391	151	240	84	38	46	305	211	94
1982	457	189	268	88	40	48	331	230	101
1984	491	210	281	83	37	46	334	230	104
1986	567	239	328	90	39	51	345	233	112
1988	629	259	370	92	39	53	361	235	126
1990*	717	300	416	98	42	56	386	252	134
					Projected				
1991	771	326	445	99	42	57	390	254	136
1992	824	351	473	100	42	58	393	255	138
1993	879	375	503	101	42	58	396	256	140
1994	911	400	511	102	43	59	399	257	142
1995	918	401	517	103	43	60	402	258	144
1996	930	406	524	104	43	61	406	261	146
1997	941	409	532	105	44	62	410	262	148
1998	956	414	543	107	44	63	417	265	151
1999	971	418	553	109	45	64	423	269	154
2000	986	423	563	110	45	65	428	271	157

*Projected.

NOTE: Projections are based on data through 1989 and have been adjusted to sum to the middle alternative projections of higher education enrollment by sex shown in table 3. Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "United States Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1980 to 1988," *Current Population Reports*, Series P-25, No. 1045, January 1990, "U.S. Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1989," *Current Population Reports*, Series P-25, No. 1057, March 1990, "Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080," *Current Population Reports*, Series P-25, No. 1018, January 1989, and "Projections of the Hispanic Population: 1983 to 2080," *Current Population Reports*, Series P-25, No. 995, November 1986; and U.S. Department of Education, National Center for Education Statistics, Fall Enrollment in colleges and Universities surveys; Integrated Postsecondary Education Data System (IPEDS) surveys; and unpublished tabulations. (This table was prepared June 1991.)

Technical Appendixes

Appendix A

Projection Methodology

The general procedure for *Projections* was to express the variable to be projected as a percent of a "base" variable. These percents were then projected and applied to projections of the "base" variable. For example, the number of 18-year-old college students was expressed as a percent of the 18-year-old population for each year from 1972 through 1989. This percent was then projected through the year 2002 and applied to projections of the 18-year-old population from the Bureau of the Census.

Enrollment projections are based primarily on population projections. Projections of classroom teachers, high school graduates, earned degrees conferred, and expenditures are based primarily on enrollment projections.

Single exponential smoothing, double exponential smoothing, and multiple linear regression are the three major projection techniques used in this publication. Single exponential smoothing is used when the historical data have a basically horizontal pattern. On the other hand, double exponential smoothing is used when the time series is expected to change linearly with time. In general, exponential smoothing places more weight on recent observations than on earlier ones. The weights for observations decrease exponentially as one moves further into the past. As a result, the older the data, the less their influence on projections. The rate at which the weights of older observations decrease is determined by the smoothing constant selected.

$$P = \alpha X_t + \alpha(1-\alpha)X_{t-1} + \alpha(1-\alpha)^2 X_{t-2} + \alpha(1-\alpha)^3 X_{t-3} + \ldots$$

Where:

P = projected constant

α = smoothing constant ($0 < \alpha < 1$)

X_t = observation for time t

This equation illustrates that the projection is a weighted average based on exponentially decreasing weights. For a high smoothing constant, weights for earlier observations decrease rapidly. For a low smoothing constant, decreases are more moderate. Projections of enrollments and public high school graduates are based on a range of smoothing constants (α = 0.1 to 0.9).

In general, the projections in this publication are based on fairly high smoothing constants. The farther apart the observations are spaced in time, the more likely are changes in the underlying social, political, and economic structure. Since the observations are on an annual basis, major shifts in the underlying process are more likely in the time span of just a few observations than if the observations were available on a monthly or weekly basis. As a result, the underlying process tends to be unstable from one observation to the next. Another reason for using high smoothing constants for some time series is that most of the observations are fairly accurate, because most observations are population values rather than sample estimates. Therefore, large shifts tend to indicate actual changes in the process rather than noise in the data.

Multiple linear regression was also used in making projections, primarily in the areas of teachers, earned degrees, and expenditures. This technique was used when it was believed that a strong causal relationship existed between the variable being projected (the dependent variable) and independent causal variables. However, this technique was used only when accurate data and reliable projections of the independent variables were available.

The functional form primarily used was the multiplicative model. When used with two independent variables, this model takes the form:

$$Y = aX_1^{b_1}X_2^{b_2}$$

This equation can easily be transformed into the linear form by taking the nature log(ln) of both sides of the equation:

$$\ln Y = \ln(a) + b_1 \ln X_1 + b_2 \ln X_2$$

The multiplicative model has a number of advantages: it is a reasonable way to represent human behavior. Constant elasticities are assumed: this says that a 1 percent change in ln X will lead to a given percent change in ln Y. This percent change is equal to b_1. And it lends itself easily to "a priori" analysis because the researcher does not have to worry about units of measurement when specifying relationships. In fact, the multiplicative model is considered the standard in economic problems. For additional information, see *Long-Range Forecasting: From Crystal Ball to Computer* by J. Scott Armstrong (John Wiley and Sons, 1978, pp. 180-181).

Caveats

Because projections are subject to errors from many sources, alternative projections are shown for some statistical series. These alternatives are not statistical con-

fidence intervals, but instead represent judgments made by the authors as to reasonable upper and lower bounds for each projected series. Alternative projections were developed for higher education enrollment, classroom teachers, earned degrees conferred, and expenditures in public elementary and secondary schools.

Assumptions

All projections are based on underlying assumptions, and these assumptions determine projection results to a large extent. It is important that users of projections understand the assumptions to determine the acceptability of projected time series for their purposes. In each chapter, there are descriptions of the primary assumptions upon which the projections of time series are based.

For some projections, low, middle, and high alternatives are shown. These alternatives reveal the level of uncertainty involved in making projections, and they also point out the sensitivity of projections to the assumptions on which they are based.

Many of the projections in this publication are demographically based. Bureau of the Census series 18 projections of the population by age were used. The future fertility rate assumption, which determines projections of the number of births, is the key assumption in making population projections. The series 18 population projections assume an ultimate complete cohort fertility rate of 2.2 births per woman by the year 2050 and a net immigration of 800,000 per year. This assumption plays a major role in determining population projections for the age groups enrolled in nursery school, kindergarten, and elementary grades. The effects of the fertility rate assumption are more pronounced toward the end of the projection period.

For enrollments in secondary grades and college, the fertility assumption is of no consequence, since all students enrolled at these levels were already born when the population projections were made. For projections of enrollments in elementary schools, only series 18 population projections were considered. Projections of high school graduates are based on projections of the number of high school graduates expressed as a percent of grade 12 enrollment. Projections of associate, bachelor's, master's, doctor's, and first-professional degrees are based on projections of college-age populations and higher education enrollment, by sex, attendance status and level enrolled by student, and by type of institution. Many of the projections of classroom teachers and expenditures of public elementary and secondary schools are based on projections of disposable income per capita. Disposable income per capita projections were obtained from The WEFA Group. Therefore, the many assumptions made in projecting disposable income per capita also apply to those projections based on projections of disposable income per capita.

A1. Enrollment

National

Enrollment projections were based on projected enrollment rates, by age and sex, which were applied to population projections by age and sex developed by the Bureau of the Census. These enrollment rates were projected by taking into account the most recent trends, as well as the effects of economic conditions and demographic changes on a person's decision to enter college. The enrollment rates were then used in an interactive forecasting model (IFMOD), which consists of age-specific rates by sex and by enrollment levels (nursery school through college). The model has 5 stages. See figure 100.

The first stage of IFMOD is an age-specific enrollment model in which enrollment rates are projected and applied to age-specific population projections. This stage, which is used separately for each sex, includes the following categories: (1) nursery and kindergarten, (2) elementary grades 1–8, (3) secondary grades 9–12, (4) full-time college enrollment, and (5) part-time college enrollment. For each of these enrollment categories, enrollment rates were projected by individual ages 3 through 24 and for the age groups 25 to 29, 30 to 34, and 35 years and over.

Enrollments by age and age groups from the Bureau of the Census were adjusted to NCES totals to compute enrollment rates for 1972 through 1989. Different assumptions were made to produce low, middle, and high alternative projections of enrollment rates to the year 2002.

Elementary Grades 1–8

Projections of elementary enrollment rates were considered for ages 5 through 21. Elementary enrollments are negligible for the remaining ages. Because most elementary enrollment rates have been fluctuating at levels close to 100 percent from 1972 to 1989, alternative enrollment rate projections were not computed. The only set of enrollment rate projections computed was based on the assumption that rates will remain constant through the year 2002 (table A1.1). Several of the rates in table A1.1 exceed 100 percent, as a result of several factors. The enrollment data by age were prorated to agree with NCES totals. The Bureau of the Census does not revise enrollment estimates by age, but population estimates are revised regularly.

Secondary Grades 9–12

Projections of secondary enrollment rates were considered for ages 12 through 34. Secondary enrollments are negligible for the remaining ages. Secondary enrollment rates have fluctuated within a narrow range from 1972 to 1989. Therefore, alternative enrollment rate projections were not calculated. The only set of projections computed was based on constant enrollment rates (table A1.2). An analysis of projection errors from the past 8 editions of *Projections of Education Statistics* indicates that the mean absolute percentage errors (MAPEs) for lead times of 1, 2, 5, and 10 years out for projections of enrollment in grades K–12 were 0.3, 0.4, 1.1, and 2.6 percent, respectively. For the 1-year-out prediction, this means that one would expect the projection to be within 0.3 percent of the actual value, on the average. For projections of enrollment in grades K–8, the MAPEs for lead times of 1, 2, 5, and 10 years were 0.4, 0.7, 1.1, and 4.3 percent, respectively, while those for projections of enrollment in grades 9–12 were 0.5, 0.5, 1.1, and 3.6 percent for the same lead times.

College Full-Time and Part-Time Enrollment

Projections of full-time and part-time college enrollments were considered only for ages 16 and over. (College enrollment is negligible for earlier ages.) Three alternative projections were made using various assumptions. Table A1.3 shows enrollment rates for 1989 and low, middle, and high alternative projected enrollment rates for 1997 and 2002.

Table A1.4 shows the equations used to project enrollment rates for 18-, 19-, and 20-year-old men enrolled full-time and part-time. Table A1.5 shows the equations used to project enrollment rates for 18-, 19-, 20-, and 21-year-old women enrolled full-time and 18- and 21-year-old women who are enrolled part-time.

Enrollment in Public Elementary and Secondary Schools, by Grade Group and Organizational Level

The third stage of IFMOD projects public enrollment in elementary and secondary schools by grade group and by organizational level. Public enrollments by age were based on enrollment rate projections for nursery and kindergarten, grade 1, elementary ungraded and special, secondary ungraded and special, and postgraduate enrollment. Grade retention rate projections were used for grades 2 through 12. Table A1.6 shows the public school enrollment rates and table A1.7 shows the public grade-retention rates for 1989 and projections for 1997 and 2002. The projected rates in tables A1.6 and A1.7 were used to compute the projections of enrollments in

elementary and secondary schools, by grade, shown in table 1.

College Enrollment, by Sex, Attendance Status, and Level Enrolled; and by Type and Control of Institution

The fourth stage of IFMOD projects enrollments in institutions of higher education, by sex, attendance status, and level enrolled by student; and by type and control of institution. For each age group, the percent that enrollment by age, attendance status, level enrolled, and by type of institution was of total enrollment was projected. These projections are shown in tables A1.8 and A1.9, along with actual values for 1989. For all projections, it was assumed that there was no enrollment in 2-year institutions at the postbaccalaureate level (graduate and first-professional).

The projected rates shown in tables A1.8 and A1.9 were then adjusted to agree with the projected age-specific enrollment rates in the first stage of IFMOD. The adjusted rates were then applied to the projected enrollments by age group, sex, and attendance status from the first stage of IFMOD to obtain projections by age group, sex, attendance status, level enrolled, and type of institution.

For each enrollment category—sex, attendance status, level enrolled, and type of institution—the percent that public enrollment was of total enrollment was projected. These projections are shwon in table A1.10, along with actual percent for 1989 and projections for 1997 and 2002. The projected rates shown were then applied to the projected enrollments in each enrollment category to obtain projections by control of institution.

For each enrollment category by sex and enrollment level, and by type and control of institution, the percent that graduate enrollment was of postbaccalaureate enrollment was projected. Actual rates for 1989 and projections for 1997 and 2002 are shown in table A1.11. The projected rates in table A1.11 were then applied to projections of postbaccalaureate enrollment to obtain graduate and first-professional enrollment projections by sex and attendance status, and by type and control of institution.

Full-Time-Equivalent Enrollment, by Type and Control of Institution and by Level Enrolled

The fifth stage of IFMOD projects full-time-equivalent enrollment, by type and control of institution and by level enrolled. For each enrollment category by level enrolled and by type and control of institution, the percent that the full-time-equivalent of part-time enrollment was of part-time enrollment was projected. Actual percents for 1989 and projections for 1997 and 2002 are shown in table A1.12.

These projected percents were applied to projections of enrollment by level enrolled and by type and control of institution from the fourth stage of IFMOD. The projections of the full-time-equivalent of part-time enrollment were added to projections of full-time enrollment (from the previous stage) to obtain projections of full-time-equivalent enrollment.

Projection Accuracy

For projections of enrollment in higher education, an analysis of projection errors based on the past five editions of Projections of Education Statistics indicates that the MAPEs for lead times of 1, 2, and 5 years were 1.7, 3.2, and 4.9 percent, respectively. For the 1-year-out prediction, this means that one would expect the projection to be within 1.7 percent of the actual value, on the average.

Basic Methodology

The notation and equations that follow describe the basic models used to project public elementary and secondary enrollment.

Public Elementary and Secondary Enrollment

Let:

i = Subscript denoting age

j = Subscript denoting grade

t = Subscript denoting time

K_t = Enrollment at the nursery and kindergarten level

G_{jt} = Enrollment in grade j

G_{1t} = Enrollment in grade 1

E_t = Enrollment in elementary special and ungraded programs

S_t = Enrollment in secondary special and ungraded programs

PG_t = Enrollment in post graduate progr[illegible]

P_{it} = Population age i

RK_t = Enrollment rate for nursery and kindergarten

RG_{jt} = Enrollment rate for grade j

RE_t = Enrollment rate for elementary special and ungraded programs

RS_t = Enrollment rate for secondary special and ungraded programs

RPG_t = Enrollment rate for post-graduate programs

EG_t = Total enrollment in elementary grades (K–8)

SG_t = Total enrollment in secondary grades (9–12)

R_{jt} = Retention rate for grade j: the proportion that enrollment in grade j in year t is of enrollment in grade j–1 in year t–1.

Then:

$$EG_t = K_t + E_t + \sum_{j=1}^{8} G_{jt}$$

$$SG_t = S_t + PG_t + \sum_{j=9}^{12} G_{jt}$$

Where:

$K_t = RK_t(P_{5t})$

$G_{jt} = R_{jt}(G_{j-1,t-1})$

$E_t = RE_t\left(\sum_{i=5}^{13} P_{it}\right)$

$G_{1t} = RG_{1t}(P_{6t})$

$S_t = RS_t\left(\sum_{i=14}^{17} P_{it}\right)$

$PG_t = RPG_t(P_{18t})$

Higher Education Enrollment

For institutions of higher education, projections were computed separately by sex and attendance status of student. The notation and equations are:

Let:

i = Subscript denoting age except:

i = 25: ages 25–29

i = 26: ages 30–34

i = 27: ages 35 and over for enrollment (35–44 for population)

t = Subscript denoting year

E_{it} = Enrollment of students age i

P_{it} = Population age i

R_{it} = Enrollment rate for students age i

T_{it} = Total enrollment for particular subset of students: full-time men, full-time women, part-time men, part-time women

Then:

$$T_{it} = \sum_{i=\cdot}^{27} E_{it}$$

Where:

$E_{it} = R_{it}(P_{it})$

Methodological Tables

The tables in this section give the rates used to calculate projections of enrollments, basic assumptions underlying enrollment projections (table A1.13), and methods used to estimate values for which data are not available (table A1.14).

Private School Enrollment

Projections of private school enrollment were derived in the following manner. For 1990, the ratio of private school enrollment to public school enrollment was calculated by grade level. These 1990 ratios were then held constant over the projection period. These ratios were then applied to projections of public school enrollment by grade level to yield projections of private school enrollment. This method assumes that the future pattern in the trend of private school enrollment will be the same as that in public school enrollment. The reader is cautioned that a number of factors could alter the assumptions of constant ratios over the projection period.

State-Level

This edition contains projected trends in elementary and secondary enrollment by grade level in public schools from 1991 to the year 2002. This is the third report on state-level projections for public school elementary and secondary education statistics.

Public school enrollment data from the National Center for Education Statistics' Common Core of Data survey for 1970 to 1989 were used to develop these projections. This survey does not collect data on enrollment for private schools. In addition, population estimates for 1970 to 1989 and population projections for 1990 to 2002 from the U.S. Department of Commerce, Bureau of the Census were used to develop the projections.

Table A1.15 describes the number of years, projection methods, and smoothing constants used to project enrollments in public schools. Also included in table A1.15 is the procedure for choosing the different smoothing constants for the time series models.

The grade retention method and the enrollment rate method were used together to project public elementary and secondary school enrollment by state. The grade retention method starts with 6-year-olds entering first grade and then follows their progress through public elementary and secondary schools. The method requires calculating the ratio of the number of children in one year who "survive" the year and enroll in the next grade the following year. The enrollment rate method expresses the enrollment of a particular age group as a percent of the population for the same age group. The projections produced from these two methods were combined to yield a composite projection of enrollment.

First, projections of enrollment in public elementary and secondary schools by state were developed using primarily the grade retention method. Kindergarten and first grade enrollments are based on projected enrollment rates of 5- and 6-year-olds. These projected enrollment rates are applied to population projections of 5- and 6-year-olds developed by the Bureau of the Census.

Enrollments in grades 2 through 12 are based on projected grade retention rates. These projected rates are then applied to the current enrollment by grade to yield grade-by-grade projections for future years. Enrollment rates of 5- and 6-year-olds and retention rates are projected using single exponential smoothing. Elementary ungraded and special enrollments and secondary ungraded and special enrollments are projected to remain constant at their 1989 levels. To obtain projections of total enrollment, projections of enrollments for the individual grades (kindergarten through 12) and ungraded and special classes were summed.

Second, projections of enrollments in public elementary and secondary schools by state were developed using the enrollment rate method. Enrollment in grades K–8 was expressed as a percent of the 5- to 13-year-old population for 1970 to 1989. Similarly, enrollment in grades 9–12 was expressed as a percent of the 14- to 17-year-old population. These percents were then projected using single exponential smoothing and applied to projections of the 5- to 13-year-old and 14- to 17-year-old populations developed by the Bureau of the Census.

The enrollment rate and grade retention methods assume that past trends in factors affecting public school enrollments will continue over the projection period. This assumption implies that all factors influencing enrollments will display future patterns consistent with past patterns. Therefore, this method has limitations when applied to states with unusual changes in migration rates. This method implicitly includes the net effect of such factors as migration, dropouts, deaths, nonpromotion, and transfers to and from private schools.

Combining Enrollment Projections

Projections of public school enrollment are based on the grade retention and enrollment rate methods. Empirical research on national models suggests that the enrollment rate method is superior to the grade retention method as the lead time of the projection increases. For longer lead times, the mean absolute percentage errors of the projections of national public school enrollment based on the enrollment rate method are smaller than those based on the grade retention method. It is reasoned that because the projections based on the enrollment rate method depend on population projections, they reflect long-term shifts in state migration patterns as projected by the Bureau of the Census. On the other hand, the projections based on the grade retention method reflect the net effects of state in- and out-migration for the short term.

The projections of enrollments developed using the grade retention and enrollment rate methods were combined using a simple linear combination of the projections as follows:

$$E = bX_1 + (1-b)X_2$$

Where:

E = combined enrollment projection

X_1 = projection based on the grade retention rate

X_2 = projection based on the enrollment rate method

b = weight

The following table presents the weights used to combine the two methods. Here, b is an adaptive parameter that changes in time to give the most weight to longer lead times for the most successful of the two projection methods, the enrollment rate.

Weights used to combine the enrollment projections, by projection method and lead time

Projection method	Lead time, in years				
	1	2	3	4	5
Grade retention	1	8/9	7/9	6/9	5/9
Enrollment rate	0	1/9	2/9	3/9	4/9

The sum of the weights b and 1-b is constrained to sum to 1. Empirical evidence suggests that the enrollment rate method is superior to the grade retention method for long lead times.

Adjustment to National Projections

The sum of the projections of state enrollments was adjusted to add to the national projections of public school K–12, K–8, and 9–12 enrollments shown in table 1. For details on the methods used to develop the national projections for this statistic, see the section on national enrollment projections in this appendix.

Projection Accuracy

Although the accuracy of past projections does not assure that the projections in this report will show similar accuracy, an analysis of projection errors helps to determine how much faith users should place in these projections.

The mean absolute percentage error (MAPE) was used to measure forecast accuracy. To compute the MAPEs for public school K–12, K–8, and 9–12 enrollments for the Nation and each state, an average of the absolute values of the 1-, 2-, 3-, 4-, and 5-year-out projection errors was computed using data from 1970 to 1984. In calculating the MAPEs, estimates of population values rather than projected values were used to project public school enrollments. MAPEs for the Nation and individual states are shown in table C1. The resultant MAPEs indicate the likely average percent of deviation between the projection and the actual value for a specific number of years into the future. For example, the MAPEs for projections of public K–12 enrollment in Alabama were 0.5 percent for 1 year out, 1.3 percent for 2 years out, and 1.5 percent for 5 years out. For the 2-year-out prediction, this means that one would expect the projection to be within 1.3 percent of the actual value.

The MAPEs for past state-level projections of public school enrollment by grade level and public high school graduates presented in table C1 were derived based on projected values that have not been adjusted to the national projected totals for these statistics. Consequently, MAPEs for some states may exhibit larger errors than would have occurred if those state projections had been adjusted to national totals as described in the above section on adjustment to national projections. Conversely, states with smaller errors may have displayed larger errors following such an adjustment.

Figure 100

General structure and methodology of the Interactive Forecasting Model (IFMOD)

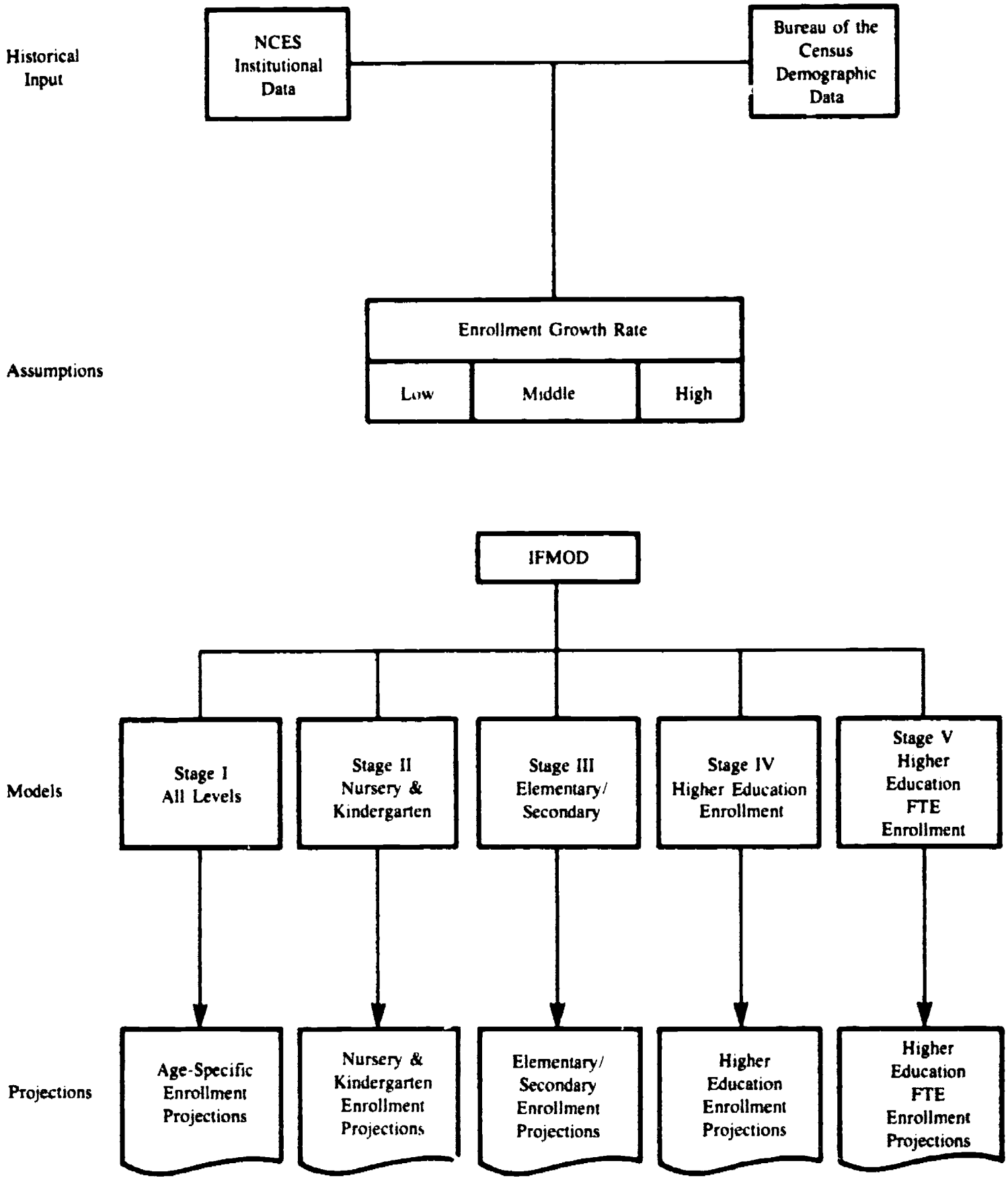


Table A1.1.—Elementary enrollment rates, by age and sex

Age	Boys		Girls	
	1989	1991–2002	1989	1991–2002
5	4.3	5.3	6.9	6.5
6	80.8	81.9	86.6	87.7
7	99.6	100.3	99.6	100.0
8	102.4	101.9	101.7	102.0
9	101.2	100.7	102.1	101.3
10	102.0	100.4	101.8	102.4
11	103.4	102.5	103.5	101.8
12	103.3	100.7	102.5	102.6
13	93.3	94.2	94.9	92.3
14	37.0	37.4	26.6	23.8
15	6.6	7.2	4.0	3.7
16	0.6	0.6	0.8	0.5
17	0.1	0.1	0	0
18	0	0	0	0

Table A1.2.—Secondary enrollment rates, by age and sex

Age	Boys		Girls	
	1989	1991–2002	1989	1991–2002
12	0.2	0.3	0.4	0.4
13	4.9	5.8	6.2	7.1
14	61.3	64.6	71.1	74.2
15	90.8	87.8	91.4	91.0
16	92.7	92.2	91.8	91.4
17	81.7	80.4	80.0	79.4
18	25.4	25.8	19.4	17.0
19	6.7	5.9	2.8	3.0
20	0.8	1.0	0.9	1.0
21	0.6	0.7	1.2	0.8
22	0.3	0.4	0.3	0.3
23	0.8	0.3	0.3	0.2
24	0.3	0.3	0.2	0.3
25–29	0.2	0.2	0.4	0.4
30–34	0.2	0.2	0.3	0.3

Table A1.3.—College enrollment rates, by age, sex, and attendance status, with alternative projections

Age, sex, and attendance status	1989	Low alternative		Middle alternative		High alternative	
		1997	2002	1997	2002	1997	2002
Men							
Full-time:							
16	0.1	0.2	0.2	0.2	0.2	0.2	0.2
17	3.0	3.1	3.1	3.1	3.1	3.1	3.1
18	27.8	32.5	31.7	32.5	31.7	32.5	31.7
19	34.8	32.0	31.1	36.0	36.0	41.2	41.2
20	27.1	29.8	27.9	29.8	27.9	29.8	27.9
21	25.6	27.3	28.9	30.7	30.7	31.3	31.3
22	16.7	17.9	17.9	18.5	18.5	19.0	19.0
23	11.9	12.2	12.6	12.2	12.6	13.6	16.3
24	9.0	8.7	8.9	8.7	8.9	15.1	19.0
25–29	3.6	3.6	3.6	3.6	3.6	4.0	4.3
30–34	1.5	1.5	1.5	1.5	1.5	1.5	1.5
35–44	1.0	1.2	1.4	1.6	2.0	1.6	2.0
Part-time:							
16	0.0	0.1	0.1	0.1	0.1	0.6	0.6
17	0.6	0.7	0.7	0.7	0.7	1.0	1.1
18	2.5	3.9	4.0	3.9	4.0	3.9	4.0
19	3.2	4.5	4.8	4.5	4.8	4.5	4.8
20	5.4	6.9	7.6	6.9	7.6	6.9	7.6
21	5.0	6.0	6.6	6.0	6.6	6.4	7.3
22	8.5	9.2	9.9	9.8	10.3	12.5	12.5
23	6.0	6.3	6.6	6.8	6.9	8.0	9.1
24	4.6	4.6	4.8	4.6	4.8	4.9	5.1
25–29	5.8	5.3	5.3	6.1	6.1	7.8	9.1
30–34	3.9	4.0	4.0	4.0	4.0	4.0	4.0
35–44	3.7	3.9	4.0	4.5	4.5	4.6	5.1
Women							
Full-time:							
16	0.4	0.3	0.3	0.6	0.7	1.0	1.0
17	4.8	4.9	4.9	4.9	4.9	4.9	4.9
18	32.1	37.3	37.6	37.3	37.6	37.3	37.6
19	38.1	40.6	42.6	40.6	42.6	44.1	44.1
20	28.0	31.5	33.9	31.5	33.9	31.5	33.9
21	28.7	31.0	32.8	31.0	33.5	35.0	35.0
22	18.4	16.4	18.4	19.0	20.0	21.9	21.9
23	10.2	10.8	12.0	13.3	13.3	13.5	13.5
24	7.9	8.4	9.2	8.9	10.9	12.3	12.3
25–29	2.9	3.1	3.2	3.3	3.5	3.7	4.2
30–34	1.7	1.9	2.1	2.0	2.2	2.0	2.2
35–44	1.7	1.9	2.1	2.4	2.4	2.6	2.6
Part-time:							
16	0.5	0.1	0.1	0.1	0.1	0.1	0.1
17	0.6	1.0	1.0	1.0	1.0	1.0	1.0
18	4.4	6.2	6.9	6.2	6.9	6.2	6.9
19	5.3	6.2	7.0	6.2	7.0	6.3	7.0
20	5.7	7.0	7.4	7.0	7.4	7.0	7.4
21	5.9	7.2	8.1	7.2	8.1	7.3	8.1
22	11.4	10.9	11.8	10.9	11.8	11.4	11.4
23	7.5	7.8	8.4	9.2	9.2	9.6	9.6
24	5.9	6.1	6.4	7.5	7.5	7.5	8.6
25–29	6.7	6.8	7.1	8.1	8.1	8.8	8.8
30–34	5.0	5.4	5.6	5.4	5.6	5.4	5.6
35–44	6.2	7.7	8.3	7.7	8.3	7.7	8.3

Table A1.4.—Equations for selected college enrollment rates of men, by age and attendance status (1967 to 1989)

	Equation	R^2	Durbin-Watson statistic [1]	Estimation technique
RTFT18M	= 0.6 − 0.0001P18M − 0.004UR1619 (−4.7) (−3.3)	0.72	1.3	OLS [2]
RTFT19M	= 0.5 − 0.00008P19M − 0.004UR1619 (−3.1) (−3.0)	0.64	1.8	OLS [2]
RTFT20M	= 0.5 − 0.0001P20M + 0.0000008YD90(−2) (−5.9) (1.3)	0.63	2.2	OLS [2]
RTPT18M	= 0.01 + 0.001UR1619 + 0.0000007YD90 (3.5) (3.7)	0.72	1.9	OLS [2]
RTPT19M	= 0.01 + 0.001UR1619 + 0.000001YD90 (2.5) (4.2)	0.70	2.1	OLS [2]
RTPT20M	= 0.001 + 0.00002YD90 (6.4)	0.66	1.6	OLS [2]

R^2 = Coefficient of determination.

[1] For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw-Hill, 1972, pages 251–252.

[2] OLS equals Ordinary Least Squares.

Where:

RTFT18M = Enrollment rate of 18-year-old males enrolled full- time
RTFT19M = Enrollment rate of 19-year-old males enrolled full- time
RTFT20M = Enrollment rate of 20-year-old males enrolled full- time
RTPT18M = Enrollment rate of 18-year-old males enrolled part- time
RTPT19M = Enrollment rate of 19-year-old males enrolled part- time
RTPT20M = Enrollment rate of 20-year-old males enrolled part- time
P18M = 18-year-old male population
P19M = 19 year-old male population
P20M = 20-year-old male population
UR1619 = Unemployment rate of 16- to 19-year-olds
YD90 = Disposable income in billions of 1989-90 dollars
YD90(-2) = Disposable income in billions of 1989-90 dollars lagged 2 years

NOTE: Numbers in parentheses are t-statistics.

Table A1.5.—Equations for selected college enrollment rates of women, by age and attendance status (1967 to 1989)

	Equation	R^2	Durbin-Watson statistic[1]	Estimation technique
RTFT18W	= 0.4 − 0.000008P18W + 0.000002YD90 (2.7) (3.2)	0.49	2.5	OLS[2]
RTFT19W	= 0.2 − 0.000005P19W + 0.000006YD90 (−1.8) (8.2)	0.77	1.9	OLS[2]
RTFT20W	= 0.1 + 0.000005YD90 (7.2)	0.71	1.7	OLS[2]
RTFT21W	= 0.1 − 0.000003P21W + 0.000006YD90 (−2.1) (9.1)	0.81	1.1	OLS[2]
RTPT18W	= 0.002 + 0.000001YD90 (6.1)	0.64	1.8	OLS[2]
RTPT21W	= 0.002 + 0.000002YD90 (9.7)	0.82	2.2	OLS[2]

R^2 = Coefficient of determination

[1]For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw-Hill, 1972, pages 251–252.

[2]OLS equals Ordinary Least Squares.

Where:

RTFT18W = Enrollment rate of 18-year-old females enrolled full-time
RTFT19W = Enrollment rate of 19-year-old females enrolled full-time
RTFT20W = Enrollment rate of 20-year-old females enrolled full-time
RTFT21W = Enrollment rate of 21-year-old females enrolled full-time
RTPT18W = Enrollment rate of 18-year-old females enrolled part-time
RTPT21W = Enrollment rate of 21-year-old females enrolled part-time
P18W = 18-year-old female population
P19W = 19-year-old female population
P20W = 20-year-old female population
P21W = 21-year-old female population
YD90 = Disposable income in billions of 1989–90 dollars

NOTE: Numbers in parentheses are t statistics.

Table A1.6.—Enrollment rates in public schools, by grade level

Grade level	Population base age	1989	Projected	
			1997	2002
Kindergarten	5	96.8	93.4	93.4
Grade 1	6	94.8	94.5	94.5
Elementary ungraded and special	5–13	1.7	1.7	1.7
Secondary ungraded and special	14–17	2.0	2.0	2.0
Postgraduate	18	0.2	0.2	0.2

Table A1.7.—Public school grade retention rates

Grade	1989	Projected	
		1997	2002
1 to 2	95.1	94.7	94.7
2 to 3	100.4	100.0	100.0
3 to 4	100.5	100.2	100.2
4 to 5	100.5	100.3	100.3
5 to 6	101.4	101.2	101.2
6 to 7	103.1	103.4	103.4
7 to 8	98.2	98.1	98.1
8 to 9	109.5	109.1	109.1
9 to 10	92.3	92.7	92.7
10 to 11	90.8	91.0	91.0
11 to 12	90.0	90.3	90.3

Table A1.8.—Full-time enrollment, by level enrolled and type of institution, as a percent of total enrollment, for each age and sex classification

Age	Men			Women		
	1989	1997	2002	1989	1997	2002
Undergraduate, 4-year institutions						
16 17 years old	78.5	70.6	70.6	62.5	69.4	69.4
18 19 years old	68.2	67.6	67.6	66.7	68.0	68.0
20 21 years old	78.2	80.0	80.0	83.1	83.1	83.1
22 24 years old	67.7	65.9	65.9	67.6	65.0	65.0
25 29 years old	38.7	40.1	40.1	42.3	41.2	41.2
30 34 years old	28.3	29.6	29.6	38.0	38.6	38.6
35 years and over	29.1	29.7	29.7	44.6	40.7	40.7
Undergraduate, 2-year institutions						
16 17 years old	21.5	28.8	28.8	37.5	30.6	30.6
18 19 years old	31.8	32.4	32.4	33.3	32.0	32.0
20 21 years old	21.8	20.0	20.0	16.9	16.9	16.9
22 24 years old	13.8	14.6	14.6	13.1	15.3	15.3
25 29 years old	15.0	15.4	15.4	21.9	23.6	23.6
30 34 years old	20.4	19.5	19.5	34.3	33.1	33.1
35 years and over	23.0	21.8	21.8	30.4	32.4	32.4
Postbaccalaureate 4-year institutions						
16 17 years old	#	#	#	#	#	#
18 19 years old	#	#	#	#	#	#
20 21 years old	#	#	#	#	#	#
22 24 years old	18.5	19.5	19.5	19.3	19.7	19.7
25 29 years old	46.4	44.6	44.6	35.8	35.2	35.2
30 34 years old	51.3	50.9	50.9	27.7	28.3	28.3
35 years and over	47.9	48.4	48.4	25.0	27.0	27.0

Not applicable.

NOTE: Projections shown for 1997 and 2002 were adjusted to add to 100 percent before computing projections shown in tables 3 through 22.

Table A1.9.—Part-time enrollment, by level enrolled and type of institution, as a percent of total enrollment, for each age and sex classification

Age	Men			Women		
	1989	1997	2002	1989	1997	2002
Undergraduate, 4-year institutions						
16–17 years old	6.4	18.6	18.6	14.0	16.8	16.8
18–19 years old	23.8	19.4	19.4	16.8	18.5	18.5
20–21 years old	29.0	24.1	24.1	28.7	28.0	28.0
22–24 years old	32.3	32.7	32.7	25.4	28.3	28.3
25–29 years old	31.2	31.4	31.4	32.7	30.0	30.0
30–34 years old	26.7	29.1	29.1	26.1	26.0	26.0
35 years and over	24.7	26.9	26.9	26.9	26.8	26.8
Undergraduate, 2-year institutions						
16–17 years old	88.2	75.6	75.6	80.8	79.1	79.1
18–19 years old	70.1	73.7	73.7	77.9	76.7	76.7
20–21 years old	64.6	70.2	70.2	64.5	66.3	66.3
22–24 years old	54.8	54.1	54.1	61.9	58.2	58.2
25–29 years old	51.3	49.7	49.7	46.9	49.9	49.9
30–34 years old	51.5	49.2	49.2	57.0	56.2	56.2
35 years and over	50.8	46.8	46.8	53.2	52.9	52.9
Postbaccalaureate, 4-year institutions						
16–17 years old	5.4	5.8	5.8	5.2	4.2	4.2
18–19 years old	6.0	6.9	6.9	5.3	4.8	4.8
20–21 years old	6.4	5.7	5.7	6.9	5.8	5.8
22–24 years old	12.9	13.2	13.2	12.7	13.5	13.5
25–29 years old	17.5	19.0	19.0	20.3	20.1	20.1
30–34 years old	21.8	21.7	21.7	16.8	17.8	17.8
35 years and over	24.5	26.2	26.2	19.9	20.3	20.3

NOTE: Projections shown for 1997 and 2002 were adjusted to add to 100 percent before computing projections shown in tables 3 through

Table A1.10.—Public school enrollment as a percent of total enrollment, by attendance status, sex, level enrolled, and by type of institution

Enrollment category	Men			Women		
	1989	1997	2002	1989	1997	2002
Full time, undergraduate, 4 year institutions	69.7	69.5	69.5	69.3	69.0	69.0
Part time, undergraduate, 4 year institutions	72.8	72.8	72.8	70.1	70.1	70.1
Full time, undergraduate, 2 year institutions	91.3	91.0	91.0	89.4	88.8	88.8
Part time, undergraduate, 2 year institutions	96.6	96.9	96.9	97.9	98.0	98.0
Full time, postbaccalaureate, 4 year institutions	56.6	56.4	56.4	60.1	60.1	60.1
Part time, postbaccalaureate, 4 year institutions	58.5	58.7	58.7	66.6	67.5	67.5

Table A1.11.—Graduate enrollment as a percent of total postbaccalaureate enrollment, by sex and attendance status, and by type and control of institution

Enrollment category	Men			Women		
	1989	1997	2002	1989	1997	2002
Full time, 4 year, public	74.7	74.2	74.2	79.5	79.6	79.6
Part time, 4 year, public	99.2	99.0	99.0	99.5	99.4	99.4
Full time, 4 year, private	56.5	55.3	55.3	63.6	63.4	63.4
Part time, 4 year, private	91.9	92.0	92.0	95.2	95.2	95.2

Table A1.12.—Full-time-equivalent of part-time enrollment as a percent of part-time enrollment, by level enrolled and by type and control of institution

Enrollment category	1989	1997	2002
Public, 4 year, undergraduate	40.0	40.0	40.0
Public, 2 year, undergraduate	33.6	33.6	33.6
Private, 4 year, undergraduate	39.9	39.8	39.8
Private, 2 year, undergraduate	40.0	40.2	40.2
Public, 4 year, graduate	36.2	36.2	36.2
Private, 4 year, graduate	38.1	38.1	38.1
Public, 4 year, first professional	50.0	52.0	52.0
Private, 4 year, first professional	52.2	54.5	54.5

TABLE A1.13.—Enrollment (assumptions)

Variables	Assumptions	Alternatives	Tables
Elementary and Secondary enrollment	Age-specific enrollment rates will remain constant at levels consistent with the most recent rates	Middle (no alternatives)	1, 2
	Public enrollment rates and public grade retention rates will remain constant at levels consistent with the most recent rates	Middle (no alternatives)	1, 2
	The percentage of 7th and 8th grade public students enrolled in school organized as secondary schools will remain constant at levels consistent with the most recent rates	Middle (no alternatives)	2
College full time and part time enrollment, by age			
Men	Age-specific enrollment rates for the younger age cohorts will increase over the projection period, while those for the older age groups are expected to remain constant at levels consistent with the most recent rates.	Middle	3–8 9–16
	Age-specific enrollment rates will equal the middle alternative rate or change at a slower rate	Low	3–8 9–16
	Age-specific enrollment rates will either equal the middle alternative or increase at a faster rate, based on past trends.	High	3–8 9–16
Women	Age specific enrollment rates for the younger age cohorts will increase over the projection period, while those for the older age groups are expected to increase slightly	Middle	3–8 9–16
	Age specific enrollment rates will equal the middle alternative rate or change at a slower rate	Low	3–8 9–16
	Age specific enrollment rates will either equal the middle alternative or increase at a faster rate, based on past trends	High	3–8 9–16
College enrollment, by sex, attendance status, and level enrolled by student, and by type of institution	For each group and for each attendance status separately, enrollment by sex and level enrolled by student, and by type of institution as a percent of total enrollment, will follow past trends through 2002. For each age group and attendance status category, the restriction that the sum of the percentages must equal 100 percent was applied	High, middle, and low	3–8 9–16
College enrollment, by control of institution	For each enrollment category, by sex, attendance status, and level enrolled by student, and by type of institution, public enrollment as a percent of total enrollment will remain constant at levels consistent with the most recent rates	High, middle, and low	3–8 9–16
Graduate enrollment	For each enrollment category, by sex and attendance status of student, and by type and control of institution, graduate enrollment as a percent of postbaccalaureate enrollment will remain constant at levels consistent with the most recent rates	High, middle, and low	17
Full time equivalent of part time enrollment	For each enrollment category, by type and control of institution and level enrolled by student, the percent that full time equivalent of part time enrollment is of part time enrollment will remain constant at levels consistent with the most recent rates	High, middle, and low	23–28

TABLE A1.14.—Enrollment (estimation methods)

Variables	Years	Estimation method	Tables
Enrollment in private elementary and secondary schools, by level	1988 1989	Grade by grade data for private elementary, secondary, and combined schools were aggregated to estimate private school enrollment by grade level.	1 2
Enrollment in institutions of higher education, by age and attendance status	1982 1987 1988	For each sex, enrollment data from the Bureau of Census by individual ages and by attendance status for 2 year age groups were combined by assuming that within the 2 year age groups, age and attendance status were distributed independently. The resultant enrollment estimates by age and attendance status were then adjusted to NCES enrollment counts by attendance status.	6 7 8

Table A1.15—Number of years, projection methods, and smoothing constants used to project public school enrollments and high school graduates, by state

Projected state variable	Number of years (1970–1989)	Projection method	Smoothing constant	Choice of smoothing constant
Enrollment rates	20	Single exponential smoothing	0.4	Empirical research
Grade retention rates	20	Single exponential smoothing	0.4	Empirical research
Graduates/grade 12 enrollment	20	Single exponential smoothing	0.4	Empirical research

A2. High School Graduates

National

Projections of public high school graduates were developed in the following manner. The number of public high school graduates was expressed as a percent of grade 12 enrollment in public schools for 1970 to 1989. This percent was projected using single exponential smoothing and applied to projections of grade 12 enrollment to yield projections of high school graduates in public schools. (The dropout rate is not related to this percent. This percent does not make any assumptions regarding the dropout rate.) The grade 12 enrollment was projected based on state-by-state retention rates and population projections developed by the Bureau of the Census. This percent was assumed to remain constant at levels consistent with the most recent rates. This method assumes that past trends in factors affecting graduation will continue over the projection period.

An analysis of projections from models used in the past eight editions of *Projections of Education Statistics* indicates that the mean absolute percentage errors (MAPEs) for projections of public high school graduates were 0.6 percent for 1 year ahead, 1.3 percent for 2 years ahead, and 1.9 percent for 5 years ahead. For the 2-year-ahead prediction, this means that one would expect the projection to be within 1.3 percent of the actual value, on the average.

Projections of private high school graduates were derived in the following manner. For 1989-90, the ratio of private high school graduates to public school graduates was calculated. This 1989-90 ratio was held constant over the projection period. It was then applied to projections of public high school graduates to yield projections of private high school graduates. This method assumes that the future pattern of private high school graduates will be the same as that of public high school graduates. The reader should be aware that a number of factors could alter the assumption of a constant ratio over the projection period.

State-Level

This edition contains projections of high school graduates from public schools by state from 1990-91 to 2001-2002. Public school graduate data from the National Center for Education Statistics' Common Core of Data survey for 1969-70 to 1989-90 were used to develop these projections. This survey does not collect graduate data for private schools.

Projections of public high school graduates by state were developed in the following manner. For each state, the number of public high school graduates was expressed as a percent of grade 12 enrollment in public schools for 1970 to 1989. This percent was projected using single exponential smoothing and applied to projections of grade 12 enrollment to yield projections of high school graduates in public schools. Projections of grade 12 enrollment were developed based on the grade retention method discussed in section A1, Enrollment. This percent was assumed to remain constant at levels consistent with the most recent rates. This method assumes that past trends in factors affecting public high school graduates will continue over the projection period.

Projection Accuracy

Although the accuracy of past projections does not assure that the projections in this report will show similar accuracy, an analysis of projection errors helps to determine how much faith users should place in these projections.

The mean absolute percentage error (MAPE) was used to measure forecast accuracy. To compute the MAPEs for public high school graduates for the Nation and each State, an average of the absolute values of the 1-, 2-, 3-, 4-, and 5-year-out projection errors was computed using data from 1970 to 1984. MAPEs for the Nation and individual states are shown in table C1. The resultant MAPEs indicate the likely average percent of deviation between the projection and the actual value for a specific number of years into the future. For example, the MAPEs for projections of public high school graduates in Alabama were 1.0 percent for 1 year out, 5.9 percent for 2 years out, and 3.3 percent for 5 years out. For the 1-year-out prediction, this means that one would expect the projection to be within 1.0 percent of the actual value.

A3. Earned Degrees Conferred

Projections of associate, bachelor's, master's, doctor's, and first-professional degrees by sex were based on demographic models that relate degree awards to college-age populations and college enrollment by level enrolled and attendance status.

Associate Degrees

Associate degree projections by sex were based on undergraduate enrollment by attendance status in 2-year institutions. Results of the regression analysis used to project associate degrees by sex are shown in table A3.1.

Bachelor's Degrees

Bachelor's degree projections by sex were based on the 18- to 24-year-old population, 25- to 34-year-old population, and undergraduate enrollment by attendance status in 4-year institutions. Results of the regression analysis used to project bachelor's degrees by sex are shown in table A3.2.

Master's Degrees

Master's degree projections by sex were based on the 35- to 44-year-old population and graduate enrollment by attendance status in 4-year institutions. Results of the regression analysis used to project master's degrees by sex are shown in table A3.3.

Doctor's Degrees

Doctor's degree projections by sex were based on the 35- to 44-year-old population, graduate enrollment by attendance status in 4-year institutions, and a time trend variable. Results of the regression analysis used to project doctor's degrees by sex are shown in table A3.4.

First-Professional Degrees

First-professional degree projections by sex were based on first-professional enrollment by attendance status in 4-year institutions. Results of the regression analysis used to project first-professional degrees by sex are shown in table A3.5.

Methodological Tables

These tables describe equations used to calculate projections (tables A3.1 through A3.5), and basic assumptions underlying projections (table A3.6).

Projection Accuracy

An analysis of projection errors from similar models used in the past six editions of *Projections of Education Statistics* indicates that mean absolute percentage errors (MAPEs) for bachelor's degree projections were 1.9 percent for 1 year out, 2.7 percent for 2 years out, and 4.2 percent for 5 years out. For the 1-year-out prediction, this means that one would expect the projection to be within 1.9 percent of the actual value, on the average. For first-professional degrees, the MAPEs were 2.3, 2.5, and 1.6 percent, respectively. For doctor's degrees, based on the past five editions of *Projections*, the MAPEs were 2.2, 2.2, and 3.3 percent, respectively. MAPEs for master's degrees, based on the past four editions of *Projections*, were 2.5, 4.2, and 6.2, respectively.

Table A3.1.—Equations for associate degrees, (1969–70 to 1988–89)

			Equation	R^2	Durbin-Watson statistic[1]	Estimation technique
Men	ASSOCM	=	15,957.8 + 179.7UGFTM2 + 22.0UGPTM2 (5.4) (1.9)	0.85	1.7	OLS[2]
Women	ASSOCW	=	776.4 + 277.5UGFTW2 (39.9)	0.99	1.5	OLS[2]

R^2 = Coefficient of determination

[1] For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw-Hill, 1972, pages 251–252

[2] OLS equals Ordinary Least Squares.

Where:

ASSOCM = Number of associate degrees awarded to men

ASSOCW = Number of associate degrees awarded to women

UGFTM2 = Full-time male undergraduate enrollment in 2-year institutions lagged 2 years

UGPTM2 = Part-time male undergraduate enrollment in 2 year institutions lagged 2 years

UGFTW2 = Full time female undergraduate enrollment in 2 year institutions lagged 2 years

NOTE: Numbers in parentheses are t statistics.

Table A3.2.—Equations for bachelor's degrees, (1969–70 to 1988–89)

		Equation	R^2	Durbin-Watson statistic [1]	Estimation technique
Men	BACHM	= 134,899.5 - 6.3P1824M - 2.7P2534M (-2.3) (-2.5) + 241.5UGFT4M - 117.7UGPT4M (7.4) (-1.2)	0.81	1.9	OLS [2]
Women	BACHW	= 142,816.7 - 13.3P1824W + 287.5UGFT4W (-6.1) (11.1) 139.0UGPT4W (-3.1)	0.99	.99	OLS [2]

R^2 = Coefficient of determination.

[1] For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw-Hill, 1972, pages 251–252.

[2] OLS equals Ordinary Least Squares.

Where:

BACHM =Number of bachelor's degrees awarded to men
BACHW =Number of bachelor's degrees awarded to women
P1824M =Population of 18- to 24-year-old males
P1824W =Population of 18- to 24-year-old females
P2534M =Population of 25- to 34-year-old males
UGFT4M =Full-time male undergraduate enrollment in 4-year institutions lagged 3 years
UGPT4M =Part-time male undergraduate enrollment in 4-year institutions lagged 3 years
UGFT4W =Full-time female undergraduate enrollment in 4 year institutions lagged 3 years
UGPT4W =Part-time female undergraduate enrollment in 4 year institutions lagged 3 years

NOTE: Numbers in parentheses are t-statistics.

Table A3.3.—Equations for master's degrees, (1969–70 to 1988–89)

		Equation	R^2	Durbin-Watson statistic[1]	Estimation technique
Men	MASTM	= 21,890.4 − 4.7P3544M + 1,034.5GFTM (−6.5) (3.9) 139.4GPTM (−1.2)	0.79	1.0	OLS[2]
Women	MASTW	= 36,038.9 − 4.3P3544W + 369.5GPTW (−5.0) (14.1)	0.95	1.3	OLS[2]

R^2 = Coefficient of determination

[1] For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw-Hill, 1972, pages 251–252.

[2] OLS equals Ordinary Least Squares

Where:

MASTM = Number of master's degrees awarded to men
MASTW = Number of master's degrees awarded to women
P3544M = Population of 35- to 44-year-old males
P3544W = Population of 35- to 44-year-old females
GFTM = Full-time male graduate enrollment lagged 2 years
GPTM = Part-time male graduate enrollment lagged 2 years
GPTW = Part-time female graduate enrollment

NOTE: Numbers in parentheses are t statistics

Table A3.4.—Equations for doctor's degrees, (1969-70 to 1988-89)

		Equation	R^2	Durbin-Watson statistic[1]	Estimation technique
Men	DOCM	= 5,535.7 + 0.5P3544M + 108.1GFTM (1.9) (3.2) - 720.5TIME (-5.9)	0.88	0.93	OLS[2]
Women	DOCW	= 1,661.9 + 9.2GPTW + 332.3TIME (3.8) (9.7)	0.99	0.86	OLS[2]

R^2 = Coefficient of determination

[1]For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw Hill, 1972, pages 251-252.

[2]OLS equals Ordinary Least Squares.

Where:

DOCM = Number of doctor's degrees awarded to men
DOCW = Number of doctor's degrees awarded to women
P3544M = Population of 35 to 44 year-old males
P3544W = Population of 35 to 44 year old females
GFTM = Full time male graduate enrollment
GPTW = Part time female graduate enrollment lagged 1 year
TIME = Time trend 1969-70 equals 1

NOTE: Numbers in parentheses are t statistics

Table A3.5.—Equations for first-professional degrees, (1969–70 to 1988–89)

		Equation	R^2	Durbin-Watson statistic[1]	Estimation technique
Men	FPROM	= 8,786.4 + 346.2FPFTM (26.9)	0.98	1.3	OLS[2]
Women	FPROW	= 2,753.0 + 264.8FPFTW + 502.4FPPTW (8.4) (1.9)	0.99	1.2	OLS[2]

R^2 = Coefficient of determination

[1] For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York, McGraw Hill, 1972, pages 251–252.

[2] OLS equals Ordinary Least Squares

Where:

FPROM — Number of first professional degrees awarded to men

FPROW — Number of first professional degrees awarded to women

FPFTM — Full-time male first professional enrollment lagged 2 years

FPFTW — Full-time female first professional enrollment lagged 1 year

FPPTW — Part-time female first professional enrollment lagged 3 years

NOTE: Numbers in parentheses are t-statistics

Table A3.6.— Earned degrees conferred (assumptions)

Variables	Assumptions	Alternatives	Tables
Associate degrees			
Men	The number of associate degrees awarded to men is a linear function of full-time and part-time undergraduate enrollment in 2-year institutions lagged 1 year. This relationship will continue through 2001–2002.	Middle	27
Women	The number of associate degrees awarded to women is a linear function of full-time undergraduate enrollment in 2-year institutions lagged 2 years. This relationship will continue through 2001–2002.	Middle	27
Bachelor's degrees			
Men	The number of bachelor's degrees awarded to men is a linear function of full-time and part-time undergraduate enrollment in 4-year institutions lagged 3 years, the 18- to 24-year-old population, and 25- to 34-year-old population. This relationship will continue through 2001–2002.	Middle	28
Women	The number of bachelor's degrees awarded to women is a linear function of full-time and part-time undergraduate enrollment in 4-year institutions lagged 3 years and the 18- to 24-year-old population. This relationship will continue through 2001–2002.	Middle	28
Master's degrees			
Men	The number of master's degrees awarded to men is a linear function of part-time graduate enrollment and the 35- to 44-year-old population. This relationship will continue through 2001–2002.	Middle	29
Women	The number of master's degrees awarded to women is a linear function of part-time graduate enrollment and the 35- to 44-year-old population. This relationship will continue through 2001–2002.	Middle	29
Doctor's degrees			
Men	The number of doctor's degrees awarded to men is a linear function of part-time graduate enrollment, time, and the 35- to 44-year-old population. This relationship will continue through 2001–2002.	Middle	30
Women	The number of doctor's degrees awarded to women is a linear function of part-time graduate enrollment, time, and the 35- to 44-year-old population. This relationship will continue through 2001–2002.	Middle	30
First professional degrees			
Men	The number of first professional degrees awarded to men is a linear function of full-time first professional enrollment lagged 1 year. This relationship will continue through 2001–2002.	Middle	31
Women	The number of first professional degrees awarded to women is a linear function of full-time first professional enrollment lagged 1 year and part-time first professional enrollment lagged 3 years. This relationship will continue through 2001–2002.	Middle	31

A4. Classroom Teachers

Public Classroom Teachers

Numbers of public elementary and secondary classroom teachers were projected using a model similar as was used in *Projections of Education Statistics to 2001: An Update*, only the coefficients were re-estimated. The number of public school teachers was projected separately for the elementary and secondary levels. The elementary teachers were modeled as a function of per capita income, local education revenue receipts from state sources per capita, and elementary enrollment. Secondary teachers were modeled as a function of per capita income, local education revenue receipts from state sources per capita (lagged 3 years), and secondary enrollment. Both per capita income and local education revenue receipts from state sources were in constant 1989–90 dollars.

The equations in this section should be viewed as forecasting rather than structural equations, as the limitations of time and available data precluded the building of a large-scale, structural teacher model. The particular equations shown were selected on the basis of their statistical properties, such as coefficients of determination (R^2s), the t-statistics of the coefficients, the Durbin-Watson statistic, and residual plots.

The multiple regression technique used yields good projections only if the relationships that existed among the variables in the past continue throughout the projection period.

The public elementary classroom teacher model is:

$$\begin{aligned} ELTCH &= b_0 + b_1 PCI \\ &\quad + b_2 SGRANT + b_3 ELENR \end{aligned}$$

where:

ELTCH is the number of public elementary classroom teachers.

PCI is disposable income per capita in 1989–90 dollars;

SGRANT is local education revenue receipts from state governments per capita in 1989–90 dollars; and

ELENR is the number of students enrolled in public elementary schools.

Each variable affects the number of teachers in the expected way. As people receive more income, the state spends more money on education, and as enrollment increases, the number of elementary teachers hired increases.

The public secondary classroom teacher model is:

$$\begin{aligned} SCTCH &= b_0 + b_1 PCI \\ &\quad + b_2 SGRANT3 + b_3 SCENR \end{aligned}$$

where:

SCTCH is the number of public secondary classroom teachers;

PCI is disposable income per capita in 1989–90 dollars;

SGRANT3 is local education revenue receipts from state governments per capita in 1988–89 dollars, lagged 3 years, and;

SCENR is the number of students enrolled in public secondary schools.

Each variable affects the number of teachers in the expected way. As people receive more income, the state spends more money on education, and as enrollment increases, the number of secondary teachers hired increases.

Table A4.1 summarizes the results for the elementary and secondary public teacher models.

Enrollment is by organizational level, not by grade level. Thus, secondary enrollment is not equal to grade 9–12 enrollment. This is because some States count some grade 7 and 8 enrollment as secondary. The distribution of the number of teachers is by organizational level, not by grade span.

Private Classroom Teachers

Projections of private classroom teachers were derived in the following manner. For 1990, the ratio of private school teachers to public school teachers was calculated by organizational level. These 1990 ratios were held constant over the projection period. The ratios were then applied to projections of public school teachers by organizational level to yield projections of private school teachers. This method assumes that the future pattern in the trend of private school teachers will be the same as that for public school teachers. The reader is cautioned that a number of factors could alter the assumption of constant ratios over the projection period.

The total number of public school teachers, enrollment by organizational level, and local education revenue receipts from state sources used in these projections were from the Common Core of Data (CCD) survey conducted by NCES. The proportion of teachers by organizational level was taken from the National Education Association and then applied to the total number of teachers from CCD to produce the number of teachers by organizational level. The number of private classroom teachers was

obtained from "Key Statistics for Public and Private Elementary and Secondary Education: School Year 1990–91," *Early Estimates*.

Disposable income and population were obtained from The WEFA Group.

Projection Accuracy

An analysis of projection errors from the past eight editions of *Projections of Education Statistics* indicated that the mean absolute percentage errors (MAPEs) for projections of classroom teachers in public elementary and secondary schools were 0.8 percent for 1 year out, 1.4 percent for 2 years out, 3.0 percent for 5 years out, and 1.8 percent for 10 years out. For the 2-year-ahead prediction, this means that one would expect the projection to be within 1.4 percent of the actual value, on the average.

Table A4.1.—Equations for public elementary and secondary classroom teachers, (1960 to 1989)

		Equation	R^2	Durbin-Watson statistic[1]	Estimation technique
Elementary	ELTCH	= -175.3 + 0.05PCP90 + 0.5SGRANT + 0.02ELENR (6.2) (2.0) (6.5)	0.99	1.2	OLS[2]
Secondary	SCTCH	= 18.9 + 0.01PCP90 + 0.8SGRANT3 + 0.03SCENR (2.0) (4.6) (10.6)	0.95	8.3	OLS[2]

R^2 = Coefficient of determination.

[1] For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw-Hill, 1972, pages 251–252.

[2] OLS equals Ordinary Least Squares.

Where:

ELTCH = Number of public elementary classroom teachers
SCTCH = Number of public secondary classroom teachers
PCP90 = Disposable income per capita in 1990 dollars
SGRANT = Local education revenue receipts from State governments
SGRANT3 = Local education revenue receipts from State governments lagged 3 years
ELENR = Number of students enrolled in public elementary schools
SCENR = Number of students enrolled in public secondary schools

NOTE: Numbers in parentheses are t-statistics. The time period of observations used in the equation for secondary teachers is from 1965 to 1989.

A5. Expenditures of Public Elementary and Secondary Schools

Econometric techniques were used to produce the projections for current expenditures and average teacher salaries. The equations in this chapter should be viewed as forecasting, rather than structural, equations. The limitations of time and available data precluded the building of large-scale, structural, models. The particular equations shown were selected on the basis of their statistical properties, such as coefficients of determination (R^2's), the t-statistics of the variables, the Durbin-Watson statistic, and residual plots.

The multiple regression technique used yields good forecasting results only if the relationships that existed among the variables in the past continue throughout the projection period.

The Elementary and Secondary School Current Expenditure Model

Economists and other researchers have progressed in developing a model of the demand for elementary and secondary school current expenditures. In most instances, researchers have used cross-sectional data. The elementary and secondary school current expenditure model builds on the knowledge gained from these cross-sectional studies and adapts them for use in a time series study.

The elementary and secondary school current expenditure model is:

$$\ln(CUREXP) = b_0 + b_1\ln(PCI) + b_2\ln(SGRANT) + b_3\ln(ADAPOP)$$

where:

ln indicates the natural log;

CUREXP equals current expenditures of public elementary and secondary schools per pupil in average daily attendance in constant 1989–90 dollars;

PCI equals disposable income per capita in constant 1989–90 dollars;

SGRANT equals local governments' education revenue receipts from state governments, per capita, in constant 1989–90 dollars; and

ADAPOP equals the ratio of average daily attendance to the population.

The model was estimated using the ordinary least squares (OLS) option of the econometrics package Regression Analysis of Time Series (RATS), using a sample period from 1959–60 to 1988–89. All variables were placed in log form, as the test statistics were superior for that form and there is some evidence from the cross-sectional studies that the log form is superior. The issue of the proper functional form was further examined by conducting a Box-Cox test while using the econometrics program SHAZAM. The hypothesis that the log-linear form is correct could not be rejected, whereas the hypothesis that the linear form is correct could be rejected.

Beginning in 1988–89, there was a major change in the survey form used to collect data on current expenditures. This new survey form produces a more complete measure of current expenditures; therefore, the values for current expenditures are not completely comparable to the previously collected numbers. In a crosswalk study, data for a majority of states were also collected for 1986–87 and 1987–88 that were comparable to data from the new survey form. A comparison of these data with those from the old survey form suggests that the use of the new survey form has increased the national figure for current expenditures by approximately 1.4 percent over what it would have been if the survey form had not been changed. When the model was estimated, all values for current expenditures before 1988–89 were increased by 1.4 percent.

The results for the model are shown in table A5.1. Each variable affects current expenditures in the direction that would be expected. As people receive more income, either directly (PCI) or from the state government (SGRANT), the level of spending increases. As the number of pupils increases relative to the population (that is, as ADAPOP increases), the level of spending per pupil falls.

From the cross-sectional studies of the demand for education expenditures, we have a rough idea of how sensitive current expenditures are to changes in PCI and ADAPOP. We can compare the results from this model with those from the cross-sectional studies. For this model, an increase in PCI of 1 percent with SGRANT and ADAPOP held constant, would result in an increase of current expenditures per pupil in average daily attendance of approximately 0.47 percent. With PCI and SGRANT held constant, an increase of 1 percent in ADAPOP would result in a decrease in current expenditures per pupil in average daily attendance of approximately 0.41 percent. Both numbers are well within the range of what has been found in other studies.

Projections for total current expenditures were made by multiplying the projections for current expenditures per pupil in average daily attendance by projections for average daily attendance. The projections for total current expenditures were divided by projections for fall

enrollment to produce projections of current expenditures per pupil in fall enrollment. Current-dollar projections were produced by multiplying the constant-dollar projections by projections for the Consumer Price Index.

As in last year's edition of *Projections of Education Statistics*, four alternative projections for current expenditures are presented: the middle-high alternative projection, the low alternative projection, the middle-low alternative projection, and the high alternative projection. The alternative projections differ because of varying assumptions about the growth paths for disposable income and revenue receipts from state sources.

Three different sets of projections for disposable income and three different sets of projections for revenue receipts from state sources were used to produce the four sets of projections for current expenditures. The middle-high alternative projections were produced using the middle projections for both disposable income and revenue receipts from state sources. The middle-low alternative projections were produced using the middle projections for disposable income and the low projections for revenue receipts from state sources. The low alternative projections were produced using the low projections for both variables, and the high alternative projections were produced using the high projections.

The middle projections for disposable income are from The WEFA Group's (WEFA's) trend scenario. The trend scenario shows the real economy, after coming out of a recession during 1991, growing at historical averages in relation to population growth. In this scenario, disposable income per capita rises each year from 1991–92 to 2001–2002 at rates between 0.3 and 2.1 percent.

The low projections for disposable income are from WEFA's pessimistic scenario. In the pessimistic scenario, growth is lower, with the change in disposable income per capita ranging between minus 0.3 and 1.7 percent during the period from 1991–92 to 2001–2002.

The high projections for disposable income per capita are from WEFA's optimistic scenario. In this scenario, disposable income per capita rises each year from 1991–92 to 2001–2002 at rates between 0.4 and 2.4 percent.

Revenue receipts from state sources have been used as an independent variable in the current expenditure model in the last three editions of *Projections of Education Statistics*. For this edition, for the first time, projections for revenue receipts from state sources were produced using an econometric model. This model was used in the production of the projections for the middle and high projections. The same method used to produce the low projections presented in the previous edition of *Projections of Education Statistics* was used for this edition.

The model for revenue receipts from state sources is:

$$SGRANT = b_0 + b_1 PERTAX1 + b_2 BUSTAX + b_3 ADAPOP + b_4 ININC2$$

where:

SGRANT equals local governments' education revenue receipts from state governments, per capita, in constant 1989–90 dollars;

PERTAX1 equals personal taxes and nontax receipts to state and local governments, per capita, in constant 1989–90 dollars lagged one period;

BUSTAX1 equals indirect business taxes and tax accruals, excluding property taxes, to state and local governments in constant 1989–90 dollars lagged one period;

ADAPOP equals the ratio of average daily attendance to the population; and

ININCR equals the rate of change in the inflation rate measured by the Consumer Price Index.

Like the equation for current expenditures, this equation was estimated using ordinary least squares for the sample period from 1959–60 to 1988–89. The results for the model are shown in table A5.1.

The values of the coefficients in this model follow expectations. As state governments receive more revenue (higher PERTAX1 and BUSTAX1), they have more money to send to local governments for education. As the enrollment increases relative to the population (higher ADAPOP), so does the amount of aid going to education. Finally, in years with rapidly increasing inflation (higher ININCR), the real dollar values of revenue receipts from state governments to local governments would fall, other things being equal.

Two alternative projections were produced for SGRANT using this model. Each is based on a different set of projections for personal taxes, business taxes, and the rate of change in the inflation rate. The middle set of projections was produced using the values for these variables from WEFA's trend scenario, and the high set of projections was produced using the values from WEFA's optimistic scenario.

The values for SGRANT used to produce projections for CUREXP for some years for the middle scenario were altered from those produced by the model. The values for 1993–94, 1994–95, and 1995–96 were increased at a lower rate than those produced by the model. The values for the years after 1995–96 were produced using the growth rates produced by the model.

A third scenario was produced using an alternative method: revenue receipts from state sources are assumed to increase at a rate equal to the growth rate of state and local purchases of goods and services as forecast by The WEFA Group. As education spending's share of all state and local government expenditures has been steadily increasing, this method may result in an underestimate. The values for the low projections used in last year's edition of *Projections of Education Statistics* were produced using the same method.

In the middle set of projections, revenue receipts from state sources increase at rates between 1.3 and 2.1 percent for the period from 1991–92 to 2001–2002. In the low set of projections, they increase at rates between 0.6 and 1.8 percent. In the high set of projections, they increase at rates between 1.1 and 3.8 percent.

The Elementary and Secondary Teacher Salary Model

Most studies conducted on teacher salaries, like those on current expenditures, have used cross-sectional data. Unlike current expenditures models, however, the models for teacher salaries from these existing cross-sectional studies cannot easily be reformulated for use with time-series data. One problem is that we do not have sufficient information concerning the supply of qualified teachers who are not presently teaching. Hence, the elementary and secondary salary model contains terms that measure the demand for teachers in the economy.

The elementary and secondary teacher salary model is:

$$SALARY = b_0 + b_1 CUREXP + b_2 ADAPOP + b_3 DIFADA1$$

where:

SALARY equals the average annual salary of teachers in public elementary and secondary schools in constant 1989–90 dollars;

CUREXP equals current expenditures of public elementary and secondary schools per pupil in average daily attendance in constant 1989–90 dollars;

ADAPOP equals the ratio of average daily attendance to the population; and

DIFADA1 equals the change in average daily attendance lagged 1 period.

The model was estimated using the period from 1959–60 to 1988–89 as a sample period. To estimate the elementary and secondary teacher salary model, a method for correcting for autocorrelation—the maximum likelihood search procedure of the program RATS—was used. This was done because the test statistics were significantly better than those from the OLS estimations, and the Durbin-Watson statistic was in the inconclusive region when the model was estimated using OLS. The Durbin-Watson statistic, however, is still in the inconclusive range, suggesting that there is still a problem with autocorrelation.

Due to the effects caused by the change shown in survey forms, the values for current expenditures for 1959–60 to 1987–88 were increased by 1.4 percent.

The results for this model are also shown in table A5.1.

There is no literature for comparing the sizes of the coefficients. However, the direction of the impact each variable has on salaries is as expected: As the level of spending per pupil increases (higher CUREXP), more teachers can be hired, so demand for teachers increases and salaries increase; as the number of students increases (higher ADAPOP and DIFADA1), demand for teachers increases, so salaries increase.

As for current expenditures, four different scenarios are presented for teacher salaries. The same projections for ADAPOP and DIFADA1 are used for each alternative projection; the sole difference between the projections is in the projection for current expenditures. The middle-high alternative projection for salaries uses the middle-high alternative projection for current expenditures. The low alternative projection for salaries uses the low alternative projection for current expenditures. The middle-low alternative projection for salaries uses the middle-low alternative projection for current expenditures. The high alternative projection for salaries uses the high alternative projection for current expenditures.

Current expenditures, average teacher salaries, and the number of teachers are interrelated. Hence, an exercise was conducted to see whether the projections of these three time series were consistent.

The number of teachers was multiplied by the average salary and then divided by current expenditures for every school year from 1977–78 until 2001–2002 (using the middle alternative projection for teachers and the middle-high projections for salaries and current expenditures). The resulting value shows the portion of current expenditures that go toward teacher salaries. The values for the projection period were all within the range of the values for the historical period.

The results of this exercise indicate that the projections of these three time series are consistent.

Projection Accuracy

This is the fourth consecutive year in which *Projections of Education Statistics* has contained projections of current expenditures and teacher salaries. The actual values of current expenditures and teacher salaries can be compared with the projected values in the previous editions to examine the accuracy of the models.

The projections from the previous editions of *Projections of Education Statistics* were placed in 1989–90 dollars using the Consumer Price Indices that appeared in those editions.

The projections for current expenditures presented in *Projections of Education Statistics to 1997–98* were produced by a model slightly different from the model used for the projections presented in this edition: calendar year data, rather than school year data, were used for disposable income, the population, and the Consumer Price Index. The independent variables used in *Projections of*

Education Statistics to 2000 and *Projections of Education Statistics to 2001: An Update* were the same as those used in this edition.

The 1-year-ahead forecast for current expenditures (using the middle alternative scenario) that appeared in *Projections of Education Statistics to 1997 98*, which is for the year 1987 88, was 1.0 percent higher than the actual value. The 1-year-ahead forecast for current expenditures per pupil in average daily attendance was 0.3 percent higher than the actual value.

The actual value for 1988–89 can be compared with the 2-year-ahead projection presented in *Projections of Education Statistics to 1997 98* and the 1-year-ahead projection presented in *Projections of Education Statistics to 2000*. The projection for current expenditures for 1988–89 that appeared in *Projections of Education Statistics to 1997 98* is 2.0 percent lower than the actual value and the projection from *Projections of Education Statistics to 2000* is 2.6 percent lower than the actual value. When placed in per pupil terms, using average daily attendance, the projection from *Projections of Education Statistics to 1997 98* is 2.4 percent lower than the actual value and the projection from *Projections of Education Statistics to 2000* is 2.3 percent lower than the actual value.

The 1989 90 *Early Estimates* can be used to measure the accuracy of the forecasts for 1989 90. The projection for current expenditures that appeared in *Projections of Education Statistics to 1997 98* is 1.2 percent lower, the projection from *Projections of Education Statistics to 2000* is 3.0 percent lower, and the projection from *Projections of Education Statistics to 2001: An Update* is 1.8 percent lower than the actual value. When placed in per pupil terms, using average daily attendance, the projections from *Projections of Education Statistics to 1997 98* are 2.0 percent lower, those from *Projections of Education Statistics to 2000* are 2.4 percent lower, and those from *Projections of Education Statistics to 2001: An Update* are 2.0 percent lower than the actual value.

Using the information above, MAPEs can be calculated for current expenditures and current expenditures per pupil. The MAPEs for projections of current expenditures were 1.8 percent for the 1-year-ahead projections, 2.5 percent for the 2 years ahead projections, and 1.2 percent for the 3-years-ahead projection. The MAPEs for current expenditures per pupil were 1.5 percent (1-year-ahead), 2.4 percent (2 years ahead), and 2.0 percent (3-years-ahead).

Some of the differences between the actual values and the projected values for current expenditures and current expenditures per pupil are due to the change in the survey form for current expenditures that took place in 1988 89. The results of the crosswalk study suggest that values for current expenditures as presently collected are approximately 1.4 percent higher than they would have been if no change had been made.

Projections for teacher salaries also appeared in the three most recent editions of *Projections of Education Statistics*.

The projections of teacher salaries presented in the earlier editions were produced using a similar set of independent variables. In that set of independent variables, unlike the set used to produce the projections presented in this edition, the change in average daily attendance lagged two periods was also included. The projections presented in *Projections of Education Statistics to 1997 98* were produced by using calendar year data, rather than school year data, for disposable income, the population, and the Consumer Price Index.

The projection of teacher salaries for 1987 88 (using the middle alternative projection) in *Projections of Education Statistics to 1997 98* was 2.6 percent high (above the actual value), the projection for 1988–89 was 4.0 percent high, the projection for 1989–90 was 3.4 percent high, and the projection for 1990–91 was 4.8 percent high. The projection for 1988 89 from *Projections of Education Statistics to 2000* was 0.8 percent high, the projection for 1989 90 was 0.4 percent low, and the projection for 1990 91 was 1.1 percent high. The projection for 1989–90 from *Projections of Education Statistics to 2001: An Update* was 0.4 percent high and the projection for 1990–91 was 2.4 percent high.

The MAPEs for projections of teacher salaries were 1.3 percent (1-year-ahead), 2.3 percent (2-years-ahead), 2.3 percent (3-years-ahead), and 4.8 (4-years-ahead).

Sources of Past and Projected Data

Numbers from several different sources were used to produce these projections. In some instances, the time series used were made by either combining numbers from various sources or manipulating the available numbers. The sources and the methods of manipulation are described here.

The time series used for current expenditures was compiled from several different sources. For the school years ending in even numbers from 1959-60 to 1975 76, the numbers for current expenditures were taken from various issues of *Statistics of State School Systems*, published by NCES. The numbers for the school years ending in odd numbers during the 1960s were taken from various issues of the National Education Association's *Estimates of School Statistics*. For the school years ending in odd numbers during the 1970s, up to and including 1976 77, the numbers were taken from various issues of *Revenues and Expenditures for Public Elementary and Secondary Education*, published by NCES. For the school years from 1977 78 until 1988 89, the numbers were taken from the NCES Common Core of Data survey and unpublished data. The number for 1989 90 was taken from the 1989 90 *Early Estimates*.

For 1974 75 and 1976 77, expenditures for summer schools were subtracted from the published figures for current expenditures. The value for 1972 73 was the sum of current expenditures at the local level, expenditures for administration by state boards of education and state

departments of education, and expenditures for administration by intermediate administrative units.

Note that although the data from the different sources are similar, they are not entirely consistent. Also, the NCES numbers beginning with 1980–81 are not entirely consistent with the earlier NCES numbers, due to differing treatments of items such as expenditures for administration by state governments and expenditures for community services.

For most years, the sources for the past values of average daily attendance were identical to the sources for current expenditures. For 1978–79, the number was taken from *Revenues and Expenditures for Public Elementary and Secondary Education*.

Projections for average daily attendance for the period from 1987–88 to 2001–2002 were made by multiplying the projections for enrollment by the average value of the ratios of average daily attendance to the enrollment from 1979–80 to 1987–88; this average value was approximately 0.93.

The values for fall enrollment from 1959–60 to 1977–78 were taken from issues of the NCES publication *Statistics of Public Elementary and Secondary Schools*. The 1978–79 value was taken from the *NCES Bulletin* of October 23, 1979, "Selected Public and Private Elementary and Secondary Education Statistics." The values from 1979–80 to 1989–90 were taken from the NCES Common Core of Data survey. The number for 1989–90 was taken from the 1989–90 *Early Estimates*. The projections for fall enrollment are those presented in Chapter 1.

For 1959–60 to 1988–89, the sources for revenue receipts from state sources were the two NCES publications *Statistics of State School Systems* and *Revenues and Expenditures for Public Elementary and Secondary Education* and the NCES Common Core of Data survey. The methods for producing the alternative projections for revenue receipts from state sources are outlined above.

The numbers for average teacher salaries were taken from various issues of the National Education Association's *Estimates of School Statistics*.

Both the past values and the projected values for the population, disposable income per capita, personal taxes and nontax receipts to state and local governments, and indirect business taxes and tax accruals, excluding property taxes, to state and local governments, were from WEFA's "Off-line U.S. Economic Service: Long-term Option." The past values and the future values of the Bureau of Labor Statistic's Consumer Price Index for all urban consumers, which was used for adjusting current expenditures, teacher salaries, revenue receipts from state sources, and the two state revenue variables, were also obtained from WEFA.

The values of all the variables from WEFA were placed in school-year terms. All the data from WEFA's trend scenario were available in quarterly format. In those cases, the school-year numbers were calculated by taking the average of the last two quarters of 1 year and the first two quarters of the next year. To calculate the values from the pessimistic and optimistic scenarios, 2-year averages of the calendar-year values were taken.

Table A5.1.—Equations for current expenditures per pupil in average daily attendance, average annual salaries of teachers, and education revenue receipts from state sources

Dependent variable	Equation	R^2	Durbin-Watson statistic	Estimation technique*	Rho
Current expenditures per pupil	ln(CUREXP) = - 0.892 + 0.466ln(PCI) + 0.691ln(SGRANT) (-.66) (1.97) (5.40) - 0.409ln(ADAPOP) (-3.86)	0.996	1.474	OLS	
Average annual salaries	SALARY = - 8843.7 + 4.39CUREXP + 122275ADAPOP (-3.47) (17.82) (11.13) + 0.00094DIFADA1 (4.60)	0.982	1.526	AR1	0.656 (3.76)
Education revenue receipts from state sources per capita	SGRANT = - 161.0 + 0.30PERTAX1 + 0.18BUSTAX1 (-6.42) (1.42) (2.43) + 1047ADAPOP - 10.2INCR (4.45) (-2.95)	0.992	2.020	OLS	

*OLS = Ordinary Least Squares. AR1 is an estimation procedure for correcting the problem of first-order autocorrelation. Specifically, the maximum likelihood procedure of the statistical program RATS was used to estimate rho. For a general discussion of the problem of autocorrelation, and the methods to correct it, see Johnston (1972), chapter 8. For a discussion of the method used to forecast in the presence of autocorrelation, see G. Judge, W. Hill, R. Griffiths, H. Lutkepohl, and T. Lee, *The Theory and Practice of Econometrics*, New York: John Wiley and Sons, 1985, pages 315–318.

NOTES: The sample size in each case is 30. Numbers in parentheses are t-statistics. $\bar{R}^2$ = Coefficient of determination, adjusted for degrees of freedom. For an explanation of the Durbin-Watson statistic, see J. Johnston, *Econometric Methods*, New York: McGraw-Hill, 1972, pages 251–252. (This table prepared May 1991.)

Appendix B

Supplementary Tables

Table B1.—Preprimary school-age populations (U.S. Census projections, Series 18): 50 States and D.C., 1977 to 2002

(In thousands)

Year (July 1)	3 years old	4 years old	5 years old	3-5 years old
1977	3,035	3,155	3,334	9,524
1978	3,117	3,091	3,156	9,364
1979	3,077	3,175	3,092	9,344
1980	3,240	3,129	3,181	9,550
1981	3,270	3,281	3,135	9,686
1982	3,378	3,311	3,285	9,974
1983	3,505	3,419	3,313	10,237
1984	3,562	3,546	3,421	10,529
1985	3,608	3,604	3,548	10,760
1986	3,625	3,650	3,605	10,880
1987	3,560	3,668	3,651	10,879
1988	3,678	3,604	3,671	10,953
1989	3,710	3,721	3,605	11,036
1990[1]	3,730	3,736	3,752	11,218
		Projected		
1991	3,804	3,778	3,740	11,322
1992	3,868	3,853	3,782	11,503
1993	3,907	3,917	3,857	11,681
1994	3,924	3,956	3,920	11,800
1995	3,920	3,974	3,960	11,854
1996	3,909	3,969	3,977	11,855
1997	3,898	3,959	3,972	11,829
1998	3,889	3,948	3,962	11,799
1999	3,883	3,939	3,951	11,773
2000	3,882	3,933	3,942	11,757
2001	3,880	3,931	3,936	11,753
2002	3,897	3,937	3,935	11,769

[1] Projected

SOURCE: U.S. Department of Commerce, Bureau of the Census, "United States Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1980 to 1988," *Current Population Reports*, series P-25, No. 1045, January 1990, and "Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080," *Current Population Reports*, Series P-25, No. 1018, January 1989.

Table B2.—School-age populations (U.S. Census projections, Series 18), ages 5, 6, 5–13, and 14–17 years: 50 States and D.C., 1977 to 2002

(In thousands)

Year (July 1)	5 years old	6 years old	5–13 years old	14–17 years old
1977	3,334	3,644	32,855	17,045
1978	3,156	3,343	32,084	16,946
1979	3,092	3,164	31,431	16,611
1980	3,181	3,112	31,095	16,142
1981	3,138	3,192	30,754	15,590
1982	3,285	3,144	30,614	15,041
1983	3,313	3,293	30,410	14,720
1984	3,421	3,321	30,238	14,704
1985	3,548	3,428	30,110	14,865
1986	3,605	3,555	30,351	14,797
1987	3,651	3,612	30,824	14,468
1988	3,671	3,660	31,306	13,983
1989	3,605	3,678	31,835	13,396
1990[1]	3,752	3,626	32,527	13,290
		Projected		
1991	3,740	3,762	33,000	13,402
1992	3,782	3,750	33,402	13,510
1993	3,857	3,792	33,934	13,873
1994	3,920	3,867	34,310	14,305
1995	3,960	3,931	34,673	14,647
1996	3,977	3,969	34,994	15,005
1997	3,972	3,987	35,200	15,272
1998	3,962	3,982	35,642	15,346
1999	3,951	3,972	35,843	15,497
2000	3,942	3,960	36,044	15,588
2001	3,936	3,949	36,200	15,790
2002	3,935	3,948	36,283	15,935

[1] Projected

SOURCE: U.S. Department of Commerce, Bureau of the Census, "United States Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1980 to 1988," *Current Population Reports*, Series P-25, No. 1045, January 1990, and "Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080," *Current Population Reports*, Series P-25, No. 1018, January 1989

Table B3.—College-age populations (U.S. Census projections, Series 18), ages 18, 18–24, 25–29, 30–34, and 35–44 years: 50 States and D.C., 1977 to 2002

(In thousands)

Year (July 1)	18 years old	18–24 years old	25–29 years old	30–34 years old	35–44 years old
1977	4,257	29,174	18,277	15,721	22,563
1978	4,247	29,622	18,683	16,280	24,437
1979	4,316	30,048	19,178	17,025	25,176
1980	4,243	30,350	19,804	17,822	25,868
1981	4,175	30,428	20,306	18,853	26,460
1982	4,115	30,283	20,865	18,876	28,115
1983	3,946	29,943	21,321	19,281	29,369
1984	3,734	29,391	21,661	19,769	30,619
1985	3,634	28,749	21,892	20,346	31,839
1986	3,562	27,968	22,132	20,847	33,145
1987	3,632	27,334	22,106	21,409	34,382
1988	3,718	26,888	22,008	21,878	35,343
1989	3,794	26,564	21,830	22,218	36,584
1990*	3,509	26,350	21,675	22,506	37,965
			Projected		
1991	3,329	25,954	21,125	22,267	39,454
1992	3,257	25,569	20,567	22,778	40,047
1993	3,334	25,330	20,008	22,705	40,917
1994	3,287	24,976	19,576	22,578	41,753
1995	3,438	24,694	19,386	22,306	42,574
1996	3,470	24,368	19,471	21,750	43,327
1997	3,581	24,447	19,346	21,189	43,897
1998	3,712	24,838	19,116	20,627	44,292
1999	3,772	25,363	18,738	20,194	44,518
2000	3,822	25,851	18,363	20,001	44,491
2001	3,843	25,734	17,848	19,988	44,199
2002	3,784	26,756	17,777	19,965	43,657

*Projected.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "United States Population Estimates, by Age, Sex, Race, and Hispanic Origin, 1980 to 1988," *Current Population Reports*, Series P-25 No. 1045, January 1990, and "Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080," *Current Population Reports*, Series P-25, No. 1018, January 1989.

Table B4.—Average daily attendance (ADA) in public elementary and secondary schools,change in ADA, the population, and ADA as a proportion of the population: 50 States and D.C., 1976–77 to 2001–02

Year ending	ADA[1] (in thousands)	Change in ADA	Population (in millions)	ADA as a proportion of the population
1977	40,832	-437,720	219.1	0.186
1978	40,080	-752,410	221.4	0.181
1979	39,076	-1,003,590	223.8	0.175
1980	38,289	-787,089	226.4	0.169
1981	37,704	-585,167	229.0	0.165
1982	37,095	-609,092	231.4	0.160
1983	36,636	-458,784	233.7	0.157
1984	36,363	-272,890	235.9	0.154
1985	36,404	41,283	238.1	0.153
1986	36,523	118,842	240.5	0.152
1987	36,864	340,764	242.8	0.152
1988	37,051	186,840	245.2	0.151
1989	37,282	231,046	247.6	0.151
1990[2]	37,511	229,708	250.1	0.150
1991[2]	37,974	462,921	252.7	0.150
		Projected		
1992	38,482	507,696	255.2	0.151
1993	39,107	624,784	257.7	0.152
1994	39,774	667,362	260.0	0.153
1995	40,494	720,122	262.1	0.154
1996	41,136	641,445	264.2	0.156
1997	41,721	584,983	266.2	0.157
1998	42,194	472,985	268.2	0.157
1999	42,536	342,474	270.1	0.157
2000	42,833	297,120	272.0	0.157
2001	43,077	243,434	273.9	0.157
2002	43,302	224,922	275.8	0.157

Projections of average daily attendance were made by multiplying the forecasts for enrollment reported earlier in this publication by the average value of the ratio of average daily attendance to the enrollment from 1980 to 1989; this average was approximately 0.93.

[1] Average daily attendance is estimated on the basis of past data.

[2] Projected.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems, Revenues and Expenditures for Public Elementary and Secondary Education*, Common Core of Data survey, and "Key Statistics for Public Elementary and Secondary Education: School Year 1990-91," *Early Estimates*. The WEFA Group, "Off-line U.S. Economic Service Long-term Option," and National Education Association, annual *Estimates of State School Statistics* (Latest edition 1990-91).

(This table prepared May 1991.)

Table B5.—Disposable personal income per capita (in constant 1989–90 dollars),[1] with alternative projections: 50 states and D.C., 1976–77 to 2001–2002

Year ending	Disposable personal income per capita		
1977	$12,281		
1978	12,719		
1979	13,054		
1980	12,962		
1981	12,939		
1982	12,948		
1983	12,985		
1984	13,556		
1985	14,011		
1986	14,300		
1987	14,464		
1988	14,812		
1989	15,248		
1990	15,352		
1991[2]	15,119		
	Trend alternative projections	**Pessimistic alternative projections**	**Optimistic alternative projections**
1992	15,164	$15,133	$15,298
1993	15,437	15,323	15,615
1994	15,718	15,527	15,978
1995	16,044	15,778	16,358
1996	16,371	16,043	16,748
1997	16,664	16,245	17,116
1998	16,899	16,414	17,435
1999	17,116	16,554	17,724
2000	17,346	16,710	18,034
2001	17,583	16,851	18,352
2002	17,820	16,991	18,670

[1] Based on the price deflator for personal consumption expenditures, Bureau of Labor Statistics, U.S. Department of Labor.

[2] Projected.

SOURCE: The WEFA Group, "Off-line U.S. Economic Service: Long-term Option." This table prepared April 1991.

Table B6.—Education revenue receipts from state source, per capita (in constant 1989–90 dollars),[1] with alternative projections: 50 states and D.C. 1976–77 to 2001–2002

Year ending	Education revenue receipts from state sources per capita
1977	$323
1978	321
1979	332
1980	328
1981	321
1982	306
1983	312
1984	319
1985	330
1986	357
1987	370
1988	375
1989	386
1990[2]	395
1991[2]	400

	Middle alternative projections	Low alternative projections	High alternative projections
1992	404	$397	$405
1993	412	403	415
1994	420	410	428
1995	429	417	443
1996	438	424	456
1997	447	431	467
1998	455	437	474
1999	461	443	479
2000	466	450	485
2001	471	456	492
2002	478	462	501

[1] Based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor

[2] Projected

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems; Revenues and Expenditures for Public Elementary and Secondary Education;* Common Core of Data survey, and "Key Statistics for Public Elementary and Secondary Education: School Year 1990-91," *Early Estimates*, and National Education Association, annual *Estimates of State School Statistics* (Latest edition 1990-91. Copyright 1991 by the National Education Association. All rights reserved.) (This table prepared May 1991.)

Table B7.—Consumer Price Index (base year = 1989–90), with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Consumer Price Index		
1977	0.462		
1978	0.493		
1979	0.539		
1980	0.611		
1981	0.682		
1982	0.741		
1983	0.773		
1984	0.801		
1985	0.833		
1986	0.857		
1987	0.877		
1988	0.913		
1989	0.954		
1990	1.000		
1991	1.058		
	Trend alternative projections	Pessimistic alternative projections	Optimistic alternative projections
1992	1.089	1.092	1.091
1993	1.130	1.134	1.131
1994	1.19	1.187	1.180
1995	1.25	1.248	1.238
1996	1.311	1.310	1.293
1997	1.378	1.376	1.352
1998	1.441	1.445	1.413
1999	1.510	1.518	1.477
2000	1.583	1.594	1.544
2001	1.659	1.673	1.613
2002	1.739	1.757	1.686

[1] Projected

SOURCE: The WEFA Group, "Off-line U.S. Economic Service Long-term Option." (This table prepared April 1991.)

Table B8.—Rate of change for the inflation rate based on the Consumer Price Index, with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Rate of change for the inflation rate using the Consumer Price Index		
1977	0.170		
1978	0.135		
1979	0.408		
1980	0.414		
1981	0.125		
1982	0.253		
1983	0.507		
1984	0.134		
1985	0.064		
1986	0.260		
1987	0.223		
1988	0.810		
1989	0.122		
1990	0.037		
1991*	0.217		
	Trend alternative projections	**Pessimistic alternative projections**	**Optimistic alternative projections**
1992	0.228	0.196	0.218
1993	0.075	0.029	0.056
1994	0.282	0.203	0.192
1995	0.074	0.080	0.072
1996	0.026	0.011	0.011
1997	0.004	0.006	0.012
1998	0.000	0.004	0.012
1999	0.003	0.001	0.000
2000	0.002	0.002	0.002
2001	0.002	0.004	0.004
2002	0.002	0.004	0.000

*Projected

SOURCE: The WEFA Group, "Off-line U.S. Economic Service Long-term Option." (This table prepared April 1991.)

Table B9.—Personal tax and nontax payments to state and local governments, per capita (in constant 1989–90 dollars),[1] with alternative projections: 50 States and D.C. 1976–77 to 2001–2002

Year ending	Personal tax and nontax payments to state and local governments per capita	
1977	$542	--
1978	568	--
1979	576	--
1980	565	--
1981	566	
1982	583	
1983	608	
1984	654	
1985	681	
1986	704	
1987	753	
1988	758	--
1989	785	
1990	803	
1991[2]	799	--
	Trend alternative projections	**Optimistic alternative projections**
1992	817	$827
1993	839	852
1994	857	874
1995	871	892
1996	884	909
1997	896	915
1998	904	919
1999	912	931
2000	920	944
2001	938	967
2002	961	996

[1] Based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor.

[2] Projected.

SOURCE: The WEFA Group, "Off-line U.S. Economic Service Long-term Option." (This table prepared April 1991.)

Table B10.—Indirect business taxes and tax accruals, excluding property taxes, for state and local governments, per capita (in constant 1989–90 dollars),[1] with alternative projections: 50 States and D.C., 1976–77 to 2001–2002

Year ending	Indirect business taxes and tax accruals, excluding property taxes, for state and local governments per capita	
1977	$728	—
1978	747	-
1979	754	—
1980	726	..
1981	720	
1982	710	
1983	725	-
1984	790	
1985	833	—
1986	865	..
1987	880	
1988	887	
1989	887	—
1990	886	-
1991[2]	887	-
	Trend alternative projections	Optimistic alternative projections
1992	910	$911
1993	933	947
1994	974	980
1995	1,000	1,009
1996	1,025	1,035
1997	1,047	1,059
1998	1,065	1,079
1999	1,080	1,096
2000	1,092	1,110
2001	1,103	1,123
2002	1,114	1,135

[1] Based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor.

[2] Projected.

SOURCE: The WEFA Group, "Off-line U.S. Economic Service: Long-term Option." (This table prepared April 1991.)

Appendix C

Table of Mean Absolute Percentage Errors

Table C1.—Mean absolute percentage errors (MAPEs) for public school enrollment and high school graduates, by State and lead time

State	Lead time	Enrollment			High school graduates
		K–12	K–8	9–12	
Alabama	1-year out	0.5	0.1	1.4	1.0
	2-year out	1.3	0.8	5.3	5.9
	3-year out	1.5	1.1	6.1	6.2
	4-year out	1.3	1.5	5.1	6.0
	5-year out	1.5	2.2	0.3	3.3
Alaska	1-year out	0.5	0.5	0.5	1.1
	2-year out	2.3	2.8	4.5	4.4
	3-year out	1.0	2.7	5.9	6.4
	4-year out	1.8	4.9	7.2	7.8
	5-year out	4.3	7.9	6.6	3.1
Arizona	1-year out	0.7	0.7	0.7	0.3
	2-year out	4.5	6.6	2.8	5.7
	3-year out	8.0	11.6	3.1	7.8
	4-year out	8.8	12.5	2.0	8.4
	5-year out	12.8	17.3	0.3	10.4
Arkansas	1-year out	0.0	0.1	0.3	0.5
	2-year out	0.7	1.0	2.4	3.8
	3-year out	0.8	1.4	2.9	4.1
	4-year out	0.6	2.0	2.8	4.5
	5-year out	0.5	2.1	3.4	4.0
California	1-year out	0.5	0.6	0.4	0.6
	2-year out	5.4	7.8	1.6	4.4
	3-year out	7.9	11.4	1.8	6.1
	4-year out	10.5	14.9	1.2	7.4
	5-year out	13.0	18.0	0.3	5.1
Colorado	1-year out	0.2	0.1	0.3	0.4
	2-year out	1.2	3.3	4.9	4.9
	3-year out	1.7	4.8	6.2	7.4
	4-year out	2.4	6.5	8.2	8.8
	5-year out	3.1	7.7	9.0	7.2
Connecticut	1-year out	0.3	0.1	0.6	1.0
	2-year out	0.9	2.1	7.4	2.0
	3-year out	0.8	3.0	10.9	5.9
	4-year out	0.9	3.8	13.3	4.0
	5-year out	1.4	4.4	17.5	9.1
Delaware	1-year out	0.2	0.4	0.0	1.8
	2-year out	2.6	5.3	4.2	4.3
	3-year out	3.8	8.0	6.5	5.0
	4-year out	5.0	10.4	8.6	5.5
	5-year out	6.2	12.4	9.9	5.0
District of Columbia	1-year out	0.1	0.1	0.0	0.7
	2-year out	2.5	1.2	7.0	3.9
	3-year out	3.0	1.1	8.7	5.4
	4-year out	5.1	1.9	14.3	7.7
	5-year out	7.5	3.5	19.1	14.2
Florida	1-year out	0.5	0.5	0.6	1.2
	2-year out	6.0	7.9	3.5	5.3
	3-year out	9.0	11.7	4.2	7.4
	4-year out	11.6	15.2	3.5	7.1
	5-year out	14.0	18.5	1.4	5.3
Georgia	1-year out	0.3	0.3	0.4	0.7
	2-year out	2.1	4.2	3.7	3.1
	3-year out	3.2	6.2	4.9	3.6
	4-year out	4.1	8.2	6.9	3.5
	5-year out	5.7	10.0	6.2	2.0

Table C1.—Mean absolute percentage errors (MAPEs) for public school enrollment and high school graduates, by State and lead time—Continued

State	Lead time	Enrollment			High school graduates
		K–12	K–8	9–12	
Hawaii	1-year out	0.0	0.0	0.2	0.7
	2-year out	1.3	4.3	6.1	3.5
	3-year out	2.1	6.9	10.2	3.2
	4-year out	2.7	8.5	12.6	2.1
	5-year out	3.3	9.6	13.5	0.5
Idaho	1-year out	0.1	0.1	0.0	0.7
	2-year out	1.5	2.2	0.7	2.2
	3-year out	2.6	3.8	0.4	3.4
	4-year out	3.0	4.4	0.9	4.3
	5 year out	3.2	4.9	1.4	6.3
Illinois	1-year out	0.1	0.1	0.0	0.9
	2-year out	1.0	1.0	5.0	3.1
	3-year out	1.5	1.2	7.7	3.1
	4-year out	1.9	1.5	10.2	1.6
	5-year out	2.1	2.0	12.1	5.1
Indiana	1-year out	0.1	0.2	0.1	0.8
	2-year out	0.6	1.5	4.4	6.6
	3-year out	0.9	1.7	6.3	5.3
	4-year out	1.2	1.7	8.1	1.5
	5-year out	1.9	1.4	9.8	3.4
Iowa	1-year out	0.2	0.3	0.1	0.6
	2-year out	1.6	2.2	6.7	4.1
	3-year out	1.4	2.5	10.2	3.4
	4-year out	2.1	2.9	13.7	5.5
	5-year out	2.6	2.8	15.8	8.6
Kansas	1-year out	0.2	0.2	0.2	0.6
	2-year out	2.5	4.3	2.8	3.4
	3-year out	3.7	6.5	3.5	3.1
	4-year out	4.9	8.5	4.5	2.2
	5-year out	5.9	10.0	5.0	0.4
Kentucky	1-year out	0.0	0.1	0.2	0.9
	2-year out	0.8	0.7	3.9	4.9
	3-year out	1.1	0.7	4.9	5.1
	4-year out	1.6	0.4	6.6	1.3
	5-year out	2.2	0.2	8.1	2.0
Louisiana	1 year out	0.3	0.2	0.6	0.2
	2-year out	0.9	0.6	3.7	2.6
	3-year out	0.9	0.7	5.6	3.3
	4 year out	1.2	0.9	7.5	3.9
	5-year out	2.3	0.5	10.3	5.9
Maine	1-year out	0.1	0.3	0.1	0.0
	2-year out	1.5	3.1	1.8	4.0
	3-year out	2.1	4.5	4.9	2.9
	4 year out	3.1	6.2	4.5	0.7
	5-year out	2.9	6.6	6.3	0.6
Maryland	1 year out	0.1	0.0	0.2	1.0
	2-year out	1.5	5.3	7.6	3.7
	3 year out	2.4	8.1	11.7	4.8
	4 year out	3.0	10.4	15.7	6.5
	5 year out	3.6	12.0	18.7	10.7
Massachusetts	1-year out	0.4	0.2	0.6	0.8
	2-year out	1.7	2.4	9.7	6.4
	3-year out	2.6	2.9	15.2	8.2
	4 year out	3.3	3.7	20.3	13.1
	5-year out	4.1	4.1	24.7	20.0

Table C1.—Mean absolute percentage errors (MAPEs) for public school enrollment and high school graduates, by State and lead time—Continued

State	Lead time	Enrollment			High school graduates
		K–12	K–8	9–12	
Michigan	1 year out	0.1	0.1	0.1	0.6
	2 year out	0.8	1.5	6.3	4.2
	3 year out	1.3	2.2	9.6	2.3
	4 year out	1.7	2.9	12.9	3.3
	5 year out	2.1	3.3	15.6	7.0
Minnesota	1 year out	0.1	0.2	0.0	0.8
	2 year out	2.1	5.3	5.5	3.1
	3 year out	3.2	8.1	8.5	2.6
	4 year out	4.1	10.3	11.3	0.9
	5 year out	5.1	12.2	12.6	4.2
Mississippi	1 year out	0.2	0.3	0.1	0.8
	2 year out	3.7	5.6	3.3	6.5
	3 year out	5.0	8.2	4.1	4.5
	4 year out	6.8	11.1	5.1	5.0
	5 year out	7.2	11.9	6.1	8.6
Missouri	1 year out	0.0	0.0	0.2	0.8
	2 year out	0.8	2.4	3.6	3.9
	3 year out	1.1	3.7	5.0	3.5
	4 year out	1.6	4.8	6.2	2.7
	5 year out	1.8	5.4	7.4	2.7
Montana	1 year out	0.1	0.2	0.1	0.4
	2 year out	0.8	1.2	4.5	3.7
	3 year out	1.3	1.4	7.1	3.8
	4 year out	1.6	1.2	8.9	2.7
	5 year out	2.1	0.9	10.0	2.5
Nebraska	1 year out	0.0	0.0	0.1	0.7
	2 year out	0.8	2.2	3.0	2.7
	3 year out	1.2	3.4	4.1	3.0
	4 year out	1.7	4.3	5.0	2.8
	5 year out	2.0	4.9	5.6	0.1
Nevada	1 year out	0.4	0.4	0.5	0.4
	2 year out	8.1	10.5	2.0	4.4
	3 year out	11.9	15.4	2.8	8.1
	4 year out	15.6	19.9	4.0	8.3
	5 year out	18.8	23.6	5.5	7.8
New Hampshire	1 year out	0.3	0.3	0.4	0.8
	2 year out	3.2	6.7	5.9	6.0
	3 year out	4.7	10.0	8.3	5.9
	4 year out	6.3	13.0	10.7	2.2
	5 year out	7.6	15.2	12.3	1.2
New Jersey	1 year out	0.2	0.2	0.3	1.0
	2 year out	2.0	1.4	9.2	4.5
	3 year out	3.2	1.7	14.5	4.0
	4 year out	4.1	2.2	19.2	6.4
	5 year out	4.9	2.4	23.2	12.2
New Mexico	1 year out	0.4	0.8	2.8	0.4
	2 year out	3.3	3.6	4.8	1.8
	3 year out	5.0	4.2	6.7	1.0
	4 year out	6.5	5.2	9.5	0.6
	5 year out	8.0	4.1	16.5	2.8
New York	1 year out	0.2	0.1	0.3	1.0
	2 year out	1.2	1.9	8.0	4.4
	3 year out	1.8	3.0	12.3	4.2
	4 year out	2.5	3.8	16.6	6.8
	5 year out	3.1	4.4	20.4	13.1

Table C1.—Mean absolute percentage errors (MAPEs) for public school enrollment and high school graduates, by State and lead time—Continued

State	Lead time	Enrollment			High school graduates
		K–12	K–8	9–12	
North Carolina	1-year out	0.0	0.2	0.2	0.1
	2-year out	0.3	1.3	3.4	3.2
	3-year out	0.3	1.5	4.4	2.6
	4-year out	0.5	1.7	5.9	2.2
	5-year out	0.7	1.9	7.2	3.6
North Dakota	1-year out	0.0	0.0	0.1	1.0
	2-year out	0.4	0.8	2.6	7.4
	3-year out	0.4	1.3	3.6	6.2
	4-year out	0.4	1.6	5.2	1.2
	5-year out	0.8	1.5	6.6	6.1
Ohio	1-year out	0.1	0.2	0.1	0.9
	2-year out	0.8	1.4	4.6	3.7
	3-year out	1.0	1.5	6.9	3.9
	4-year out	1.5	1.8	9.3	2.5
	5-year out	2.2	1.8	11.5	2.2
Oklahoma	1-year out	0.1	0.1	0.6	0.4
	2-year out	1.3	1.0	4.9	3.2
	3-year out	1.8	0.8	6.2	3.7
	4-year out	2.0	1.2	8.3	4.2
	5-year out	1.9	1.0	9.8	4.1
Oregon	1-year out	0.0	0.0	0.1	0.3
	2-year out	2.1	4.4	3.3	3.0
	3-year out	3.3	6.7	5.1	2.2
	4-year out	4.2	8.6	6.7	1.6
	5-year out	5.4	10.2	6.9	1.2
Pennsylvania	1-year out	0.2	0.2	0.3	0.8
	2-year out	1.1	2.1	7.4	4.0
	3-year out	1.5	3.0	11.2	4.9
	4-year out	2.1	3.8	15.4	6.7
	5-year out	2.8	4.2	18.7	11.3
Rhode Island	1-year out	0.1	0.1	0.4	1.0
	2-year out	0.6	3.7	8.4	4.1
	3-year out	0.4	5.4	12.8	6.0
	4-year out	1.0	7.2	17.5	8.3
	5-year out	0.8	8.8	20.3	12.8
South Carolina	1-year out	0.1	0.1	0.2	1.3
	2-year out	0.9	2.0	3.0	4.5
	3-year out	1.4	2.9	3.6	4.5
	4-year out	1.8	4.0	3.6	4.4
	5-year out	2.2	4.8	4.5	0.6
South Dakota	1-year out	0.2	0.2	0.0	1.1
	2-year out	1.3	3.2	3.7	4.8
	3-year out	2.1	5.0	5.6	4.4
	4-year out	2.6	6.3	7.6	1.5
	5-year out	3.2	7.3	8.5	5.6
Tennessee	1-year out	0.1	0.2	0.3	0.7
	2-year out	0.6	1.2	2.6	6.0
	3-year out	0.6	1.4	3.0	6.9
	4-year out	0.6	1.7	2.1	8.7
	5-year out	0.3	1.5	2.7	7.9
Texas	1-year out	0.6	0.6	0.4	0.3
	2-year out	3.4	4.1	1.6	4.1
	3-year out	4.8	5.8	2.3	6.7
	4-year out	6.7	8.0	3.0	7.9
	5-year out	8.7	10.4	3.8	8.7

Table C1.—Mean absolute percentage errors (MAPEs) for public school enrollment and high school graduates, by State and lead time—Continued

State	Lead time	Enrollment			High school graduates
		K–12	K–8	9–12	
Utah	1-year out	0.7	0.6	0.7	0.3
	2-year out	4.4	4.3	4.7	6.4
	3-year out	6.4	6.3	6.8	10.2
	4-year out	8.6	8.4	9.2	12.5
	5-year out	10.8	10.4	12.0	14.5
Vermont	1-year out	0.0	0.0	0.1	0.8
	2-year out	2.1	3.9	5.4	3.3
	3-year out	3.0	5.9	5.5	3.3
	4-year out	4.2	7.6	4.8	3.0
	5-year out	4.9	9.2	6.5	0.7
Virginia	1-year out	0.1	0.1	0.3	0.4
	2-year out	0.9	2.8	4.6	2.9
	3-year out	1.3	4.3	6.3	4.8
	4-year out	1.7	5.6	8.1	5.8
	5-year out	2.0	6.3	9.1	4.3
Washington	1-year out	0.2	0.2	0.3	0.2
	2-year out	3.5	6.3	3.5	5.8
	3-year out	5.2	9.4	5.1	9.8
	4-year out	6.9	12.1	6.5	10.6
	5-year out	8.5	14.2	6.4	9.1
West Virginia	1-year out	0.3	0.5	0.2	0.3
	2-year out	4.2	4.8	3.2	2.1
	3-year out	6.5	7.4	4.4	2.0
	4-year out	8.7	9.8	6.1	1.8
	5-year out	10.8	12.3	7.5	1.2
Wisconsin	1-year out	0.0	0.2	0.3	1.1
	2-year out	0.7	4.0	6.5	3.4
	3-year out	1.1	6.1	9.9	5.4
	4-year out	1.4	7.9	3.5	6.7
	5-year out	2.0	9.5	15.7	13.1
Wyoming	1-year out	0.3	0.3	0.4	0.3
	2-year out	2.3	2.3	3.3	4.7
	3-year out	3.9	4.0	3.9	6.1
	4-year out	4.7	4.6	4.8	6.3
	5-year out	4.2	4.2	4.3	5.2

NOTE: To compute the MAPEs for the Nation and States, an average of the absolute values of the 1-, 2-, 3-, 4- and 5-year-out projection errors was calculated using data from 1970 to 1984. The MAPE indicates the likely average percent of deviation between the projection and the actual value for 1 to 5 years into the future.

Appendix D

Data Sources

Sources and Comparability of Data

The information in this report was obtained from many sources, including Federal and state agencies, private research organizations, and professional associations. The data were collected by many methods, including surveys of a universe (such as all colleges) or of a sample, and compilations of administrative records. Care should be used when comparing data from different sources. Differences in procedures, such as timing, phrasing of questions, and interviewer training mean that the results from the different sources are not strictly comparable. More extensive documentation of one survey's procedures than of another's does not imply more problems with the data, only that more information is available

Accuracy of Data

The accuracy of any statistic is determined by the joint effects of "sampling" and "nonsampling" errors. Estimates based on a sample will differ from the figures that would have been obtained if a complete census had been taken using the same survey instruments, instructions, and procedures. Besides sampling errors, both surveys, universe and sample, are subject to errors of design, reporting, processing, and errors due to nonresponse. To the extent possible, these nonsampling errors are kept to a minimum by methods built into the survey procedures. In general, however, the effects of nonsampling errors are more difficult to gauge than those produced by sampling variability.

Sampling Errors

The standard error is the primary measure of sampling variability. It provides a specific range with a stated confidence—within which a given estimate would lie if a complete census had been conducted. The chances that a complete census would differ from the sample by less than the standard error are about 68 out of 100. The chances that the difference would be less than 1.65 times the standard error are about 90 out of 100; that the difference would be less than 1.96 times the standard error, about 95 out of 100; and that it would be less than 2.58 times as large, about 99 out of 100.

The standard error can help assess how valid a comparison between two estimates might be. The standard error of a difference between two sample estimates that are uncorrelated is approximately equal to the square root of the sum of the squared standard errors of the estimates. The standard error (se) of the difference between sample estimate "a" and sample estimate "b" is:

$$se_{a-b} = \sqrt{se_a^2 + se_b^2}$$

Note that most of the standard errors in subsequent sections and in the original documents are approximations. That is, to derive estimates of standard errors that would be applicable to a wide variety of items and could be prepared at a moderate cost, a number of approximations were required. As a result, most of the standard errors presented provide a general order of magnitude rather than the exact standard error for any specific item.

Nonsampling Errors

Both universe and sample surveys are subject to nonsampling errors. Nonsampling errors are of two kinds random and nonrandom. Random nonsampling errors may arise when respondents or interviewers interpret questions differently, when respondents must estimate values, or when coders, keyers, and other processors handle answers differently. Nonrandom nonsampling errors result from total nonresponse (no usable data obtained for a sampled unit), partial or item nonresponse (only a portion of a response may be usable), inability or unwillingness on the part of respondents to provide information, difficulty interpreting questions, mistakes in recording or keying data, errors of collection or processing, and overcoverage or undercoverage of the target universe. Random nonresponse errors usually, but not always, result in an understatement of sampling errors and thus an overstatement of the precision of survey estimates. Because estimating the magnitude of nonsampling errors would require special experiments or access to independent data, these magnitudes are seldom available.

To compensate for suspected nonrandom errors, adjustments of the sample estimates are often made. For example, adjustments are frequently made for nonresponse, both total and partial. An adjustment made for either type of nonresponse is often referred to as an imputation, that is, substitution of the "average" questionnaire response for the nonresponse. Imputations are usually made separately within various groups of sample members that have similar survey characteristics. Imputation for item

nonresponse is usually made by substituting for a missing item the response to that item of a respondent having characteristics that are similar to those of the nonrespondent.

Although the magnitude of nonsampling errors in the data collected in this *Projections* is frequently unknown, idiosyncrasies that have been identified are noted on the appropriate tables.

Federal Agency Sources

National Center for Education Statistics (NCES)

Common Core of Data

NCES uses the Common Core of Data (CCD) survey to acquire and maintain statistical data on the 50 States, the District of Columbia, and the outlying areas from the universe of state-level education agencies. Information about staff and students is collected annually at the school, LEA (local education agency or school district), and state levels. Information about revenues and expenditures is also collected at the state level.

Data are collected for a particular school year (July 1 through June 30) by survey instruments sent to the states by October 15 of the subsequent school year. States have 2 years in which to modify the data originally submitted.

Since the CCD is a universe survey, the CCD information in *Projections* is not subject to sampling error. However, nonsampling error could come from two sources—nonreturn and inaccurate reporting. Almost all of the states submit the six CCD survey instruments each year, but there are many delays in submitting data and the submissions are sometimes incomplete.

Understandably, when 57 education agencies compile and submit data for over 85,000 public schools and approximately 15,800 local school districts, misreporting can occur. Typically, this results from varying interpretation of NCES definitions and differing recordkeeping systems. NCES attempts to minimize these errors by working closely with the Council of Chief State School Officers (CCSSO) and its Committee on Evaluation and Information Systems (CEIS).

The state education agencies report data to NCES from data collected and edited in the regular reporting cycles for which NCES reimburses them. NCES encourages the agencies to incorporate into their own survey systems the NCES items they do not collect so those items will also be available for the subsequent CCD survey. Over time, this has meant fewer missing data cells in each state's response, reducing the need to impute data.

NCES subjects data from the education agencies to a comprehensive edit. Where data are determined to be inconsistent, missing, or out of range, NCES asks the education agencies for verification. NCES-prepared state summary forms are returned to the state education agencies for verification. States are also given an opportunity to revise their state-level aggregates from the previous survey cycle.

Questions concerning the Common Core of Data can be directed to:

John Sietsema
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Public School Early Estimates System. The Public School Early Estimates System is designed to allow NCES to report selected key statistics early in the school year. Statistics include the number of students in membership, teachers, and high school graduates, and total revenues and expenditures. These estimates are either preliminary actual counts for individual states, estimates derived by the States for NCES, or imputed values developed by NCES using a combination of state-specific and national data.

Forty-eight States and the District of Columbia participated in the 1989 survey. Estimates reported in this book were provided to NCES by state education agencies and represent the best information available to states at this early stage of the school year. They are, however, subject to revision.

Early in November of each year, a survey form is sent to each state education agency requesting cooperation and specifying when NCES will collect data by telephone. States are contacted during the first week in November, and state estimates are received through the third week in December. Data collected by telephone are checked for reasonableness against prior years' data.

Questions concerning the Public School Early Estimates System can be directed to:

Frank Johnson
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Private School Early Estimates System: 1988–89. The private school early estimates are the first reporting component of the Private School Universe data collection system. In subsequent years, the statistical information will be collected from all private schools in the NCES universe, and the early estimates will be based on a subsample of that universe.

Early in October 1988, questionnaires were mailed to a national probability sample of 1,167 private elementary and secondary schools from a universe of approximately 30,000 private schools. Telephone followup of nonrespondents was initiated in late October, and data collection was completed in late November. The overall response rate was 94 percent: 978 of the 1,035 eligible schools. Some 132 of the original 1,167 schools in the

sample were determined to be out of scope. While this survey was not designed specifically to yield an estimate of the number of private schools, the number of out-of-scope schools identified in this survey resulted in a weighted estimate of approximately 26,300 private schools.

The sampling frame used for the survey was composed of two non-overlapping frames: the NCES list frame of approximately 24,000 eligible schools, and an area frame developed by the Census Bureau for 75 Primary Sampling Units (PSUs). The area frame yielded a sample size of 523 schools for the Schools and Staffing Survey (SASS). The private school early estimates area sample was drawn from the SASS area sample. The sample from the area frame was sorted by level of school, by religious orientation class within school level, then by PSU within religious orientation class, and finally by student membership within PSU.

The sample from the list frame was stratified by level of school (elementary, secondary, combined, and other) and religious orientation (Catholic, other religious, and nonsectarian), and within strata schools were further sorted by Office of Education regions, and by student membership size within region. Each school in the sorted frame was assigned a sampling measure of size equal to the square root of student membership, and samples were selected with probabilities proportionate to size from each orientation/level stratum.

The survey data were weighted to reflect the sampling rates (probability of selection) and were adjusted for nonresponse. Estimates of standard errors were computed using a variance estimation procedure for complex sample survey data known as jackknife. The standard errors for private school early estimates for school years 1987–88 and 1988–89 are shown in the table below.

Students (1988–89)	Teachers (1988–89)	Graduates (1987–88)
96,779	7,624	9,605

Nonsampling errors may include such things as differences in the respondents' interpretation of the meaning to the questions, differences related to the particular time the survey was conducted, or errors in data preparation. During the design of the survey and survey pretest, an effort was made to check for consistency of interpretation of questions and to eliminate ambiguous items. The questionnaire was pretested with respondents like those who completed the survey, and the questionnaire and instructions were extensively reviewed by NCES and representatives of private school associations attending the NCES private school data users meeting. Manual and machine editing of the questionnaires was conducted to check the data for accuracy and consistency. Extensive telephone followup was conducted for missing or inconsistent items; data were keyed with 100-percent verification.

Undercoverage in the list and area frames is another possible source of nonsampling error. The area frame was used to complement the list frame through the identification of schools missing from the list frame. As the Early Estimates System and the Private School Universe data collection system develop, efforts will be directed towards updating the universe list and identifying and minimizing sources of undercoverage in both the list and area frames.

Questions concerning the Private School Early Estimates System can be directed to:

Marilyn M. McMillen
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Private School Early Estimates System: 1989–90. This is the second in a series of early estimates for private elementary and secondary education. These early estimates are key statistics reported early in the school year and include the numbers of teachers, students, and high school graduates for private elementary and secondary schools. In subsequent years, the statistical information will be collected from all private schools in the NCES universe, and the early estimates will be based on a subsample of that universe.

Early in October 1989, questionnaires were mailed to a national probability sample of 1,169 private elementary and secondary schools from a universe of approximately 27,000 private schools. Telephone followup of nonrespondents was initiated in late October, and data collection was completed in late November. The overall response rate was 95 percent: 986 of the 1,042 eligible schools. Some 127 of the original 1,167 schools in the sample were determined to be out-of-scope. While this survey was not designed specifically to yield an estimate of the number of private schools, the number of out-of-scope schools identified in this survey resulted in a weighted estimate of approximately 26,645 private schools.

The sampling frame used for the survey was composed of two non-overlapping frames: the NCES list frame of approximately 24,000 eligible schools, and an area frame developed by the Census Bureau for 75 Primary Sampling Units (PSUs). The area frame yielded a sample size of 523 schools for the Schools and Staffing Survey (SASS). The private school early estimates area sample was drawn from the SASS area sample. The sample from the area frame was sorted by level of school, by religious orientation class within school level, then by PSU within religious orientation class, and finally by student membership within PSU.

The sample from the list frame was stratified by level of school (elementary, secondary, combined, and other) and religious orientation (Catholic, other religious, and nonsectarian), and within strata schools were further sorted by Census regions, and by student membership size

within region. Each school in the sorted frame was assigned a sampling measure of size equal to the square root of student membership. The sample design for the list frame was similar, differing in two ways from the design for the area frame. First, stratification by level of school yielded four, rather than three categories: elementary, secondary, combined, and other. Second, the measure of size was simply the square root of student membership.

The survey data were weighted to reflect the sampling rates (probability of selection) and were adjusted for nonresponse. Estimates of standard errors were computed using a variance estimation procedure for complex sample survey data known as balanced repeated replication. The standard errors for private school early estimates for school years 1988–89 and 1989–90 are shown in the table below.

Students (1989–90)	Teachers (1989–90)	Graduates (1988–89)
117,830	8,636	13,305

Nonsampling errors may include such things as differences in the respondents' interpretations of the meaning to the questions, differences related to the particular time the survey was conducted, or errors in data preparation. The survey instrument used in the 1989-90 Early Estimates data collection was developed based on the experiences of the 1988-89 Early Estimates data collection. The form was modified as needed to accommodate one data collection instrument for both the Early Estimates and Universe components of the Private School data collection system. The content of the survey was developed in consultation with representatives of private school associations attending NCES private school data users meetings. The questionnaire and instructions were extensively reviewed by NCES staff. Manual and machine editing of the questionnaires was conducted to check the data for accuracy and consistency. Data were keyed with 100-percent verification.

Undercoverage in the list and area frames is another possible source of nonsampling error. The area frame was used to complement the list frame through the identification of schools missing from the list frame. As the Early Estimates System and the Private School Universe data collection system develop, both the list and area frames will be updated periodically. For the 1989-90 Early Estimates data collection, 1,000 private schools were added to the Universe list.

Questions concerning the Private School Early Estimates System can be directed to:

Marilyn M. McMillen
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Private School Early Estimates System: 1990–91. Early in September 1990, questionnaires were mailed to a national probability sample of 1,167 private elementary and secondary schools. Telephone collection of the data began in early October, and was completed in mid-October. The overall response rate was 98 percent: 1,098 of the 1,119 eligible schools. Some 48 of the original 1,167 schools in the sample were determined to be out-of-scope. After adjusting for out of scope schools the weighted estimate of private schools is 24,553.

The sampling frame used for the survey was composed of two non-overlapping frames: the NCES Private School Survey list of approximately 20,584 eligible schools (the universe list), and an area frame developed by the Census Bureau, consisting of 923 schools identified in 123 sampled geographic areas (Primary Sampling Units or PSUs). The list frame was stratified by level of school (elementary, secondary, combined, other, and unknown) and religious orientation (Catholic, other religious, and nonsectarian); within strata schools were further sorted by Census region, and by student membership size within region. Each school in the sorted frame was assigned a sampling measure of size equal to the square root of student membership.

The area frame is constructed from a sample survey designed to capture those schools not included in the universe list. The 923 schools identified in the sampled areas are weighted to a national estimate of the number of private schools not included in the universe list. This weighted number is then added to the universe count to produce an estimate of the total number of private schools in the United States. For the early estimate, the area frame was stratified by level of schools (elementary, secondary, and other) and religious orientation (Catholic, other religious, and nonsectarian). Within strata, schools were further sorted by FIPS (Federal Information Processing Standards) state code, by FIPS county code within states, and by student membership within counties. Samples were selected with probabilities proportionate to size from each stratum. The measure of size used for this purpose was the square root of student membership multiplied by the inverse of the probability of selection of the PSU in which school is located.

A new estimation procedure was used to produce the 1990 private school early estimates. This procedure used the estimates obtained from the entire universe of private schools in the Private School Survey of 1989 and adjusted these estimates for the change reflected in the 1990 early estimates data collections. The steps of this procedure were: (1) obtain Private School Survey (PSS) universe estimates for the data elements desired; (2) adjust PSS estimates for partial and total nonresponse; (3) collect 1990 early estimates data for the data for the data elements; (4) weight the early estimate sample to reflect the sampling rates (probability of selection) and to adjust for total nonresponse separately by the sampling strata and by enrollment; (5) measure the change for these data elements between the PSS and the early estimates data

collection for those schools that were in the early estimates sample and had the appropriate data for both 1989 and 1990; and (6) apply the change calculated in step 5 to the data from all of the schools in the PSS universe. Numbers in the tables and text have been rounded. Ratios have been calculated on the actual estimates rather than the rounded values. The 1990 early estimates were adjusted to account for both total and partial nonresponses.

Sample survey data, such as the private school estimates data, are subject to error due to variations in sampling. The standard error is a measure of the variability due to sampling when estimating a statistic. Estimates of standard errors were computed using a variance estimation procedure for complex sample survey data known as balanced repeated replication. The standard errors for private school early estimates for school years 1989–90 and 1990–91 are shown in the table below.

Students (1990–91)	Teachers (1990–91)	Graduates (1989–90)
96,270.9	7,341.8	15,880.2

Survey estimates are also subject to errors of reporting and errors made in the collection and processing of the data. These errors, called nonsampling errors, can sometimes bias the data. Nonsampling errors may include such things as differences in the respondents' interpretations of the meaning to the questions, differences related to the particular time the survey was conducted, or errors in data preparation. The survey instrument used in the 1990–91 private school early estimates data collection was revised as a result of the experiences of the 1989–90 private school early estimates data collection. The content of the survey was developed in consultation with representatives of private school associations attending NCES meetings for users of private school data. The questionnaire and instructions were reviewed extensively by NCES staff. Manual and machine editing of the questionnaires was conducted to check the data for accuracy and consistency. Data were keyed with 100 percent verification.

Undercoverage in the list and area frames is another possible source of nonsampling error. The area frame was used to complement the list frame through the identification of schools missing from the list frame. As the Private School Early Estimates System and the Private School Survey (the universe data collection) system develop, both the list and area frames will be updated periodically.

Questions concerning the Private School Early Estimates System can be directed to:

Sharon A. Bobbitt
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Integrated Postsecondary Education Data System

The Integrated Postsecondary Education Data System (IPEDS) surveys all postsecondary institutions, including universities and colleges, as well as institutions offering technical and vocational education beyond the high school level. This system, which began in 1986, replaces and supplements the Higher Education General Information Survey (HEGIS).

The information presented in this report draws on IPEDS surveys that solicited information concerning institutional characteristics, enrollment, and degrees. The higher education portion of this system is a census of accredited 2- and 4-year colleges. Since these surveys cover all institutions in the universe, the data are not subject to sampling error. However, they are subject to nonsampling error, the sources of which vary with the survey instrument. Each survey will therefore be discussed separately. Information concerning the nonsampling error of the enrollment and degrees surveys is drawn extensively from the HEGIS Post-Survey Validation Study conducted in 1979.

Institutional Characteristics. This survey provided the basis for the universe of institutions in the *Directory of Postsecondary Institutions*, and it is used in all other IPEDS data collection activities. The universe includes institutions that met certain accreditation criteria and offered at least a 1-year program of college-level studies leading toward a degree. All of these institutions were certified as eligible by the U.S. Department of Education's Division of Eligibility and Agency Evaluation. Each fall, institutions listed in the previous's *Directory* were asked to update a computer printout of their information.

Fall Enrollment. This survey has been part of the IPEDS or HEGIS series since 1966. HEGIS is mainly composed of 4 and 2 year colleges and universities. The enrollment survey response rate was relatively high; the 1989 response rate was 86.1 percent. Major sources of nonsampling error for this survey are classification problems, the unavailability of needed data, interpretation of definitions, the survey due date, and operational errors. Of these, the classification of students appears to be the main source of error. Institutions have problems in correctly classifying first-time freshmen, other first-time students, and unclassified students for both full-time and part-time categories. These problems occur most often at 2-year institutions (private and public) and private 4-year institutions. In 1977–78 HEGIS validation studies, the classification problem led to an estimated overcount of 11,000 full-time students and an undercount of 19,000 part-time students. Although the ratio of error to the grand total was small (less than 1 percent), the percentage of errors was as high as 5 percent for detailed student levels and even higher at certain aggregation levels.

Beginning with fall 1986, the survey system was redesigned with the introduction of IPEDS. The new survey system comprises all postsecondary institutions, but also maintains comparability with earlier surveys by allowing HEGIS institutions to be tabulated separately. The new system also provides for preliminary and revised data releases. This allows NCES flexibility to release early data sets while still maintaining a more accurate final database.

Completions. This survey was part of the HEGIS series throughout its existence. However, the degree classification taxonomy was revised in 1970-71 and 1982-83. Collection of degree data has been maintained through the IPEDS system.

Although information from survey years 1970-71 through 1981-82 is directly comparable, care must be taken if information before or after that period is included in any comparison. Degrees-conferred trend tables arranged by the 1982-83 classification have been added to the *Projections of Education Statistics* to provide consistent data from 1970-71 to 1988-89. Data in this edition on associate degrees are not directly comparable with figures for earlier years. The nonresponse rate does not appear to be a significant source of nonsampling error for this survey. The return rate over the years has been extremely high, with the response rate for the 1988-89 survey at 76.3 percent. Because of the high return rate, nonsampling error caused by imputation was also minimal.

The major sources of nonsampling error for this survey are differences between the HEGIS program taxonomy and taxonomies used by the colleges, classification of double majors and double degrees, operational problems, and survey timing. In the 1979 validation study, these sources of nonsampling error were found to contribute to an error rate of 0.3 percent overreporting of bachelor's degrees and 1.3 percent overreporting of master's degrees. The differences, however, varied greatly among fields. Over 50 percent of the fields selected for the validation study had no errors identified. Categories of fields that had large differences were business and management, education, engineering, letters, and psychology. It was also shown that differences in proportion to the published figures were less than 1 percent for most of the selected fields that had some errors. Exceptions to these were: master's and doctoral programs in labor and industrial relations (20 percent and 8 percent); bachelor's and master's programs in art education (3 percent and 4 percent); bachelor's and doctoral programs in business and commerce, and in distributive education (5 percent and 9 percent); master's programs in philosophy (8 percent); and doctoral programs in psychology (11 percent).

Questions concerning the surveys used as data sources for this report or other questions concerning HEGIS can be directed to:

Postsecondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Schools and Staffing Survey

The "Schools and Staffing Survey" (SASS) data were collected through sample surveys of school districts, schools, school administrators, and teachers. The surveys of schools and school principals were based on the 9,317 public and 3,513 private schools in the school samples. In addition, 56,242 public school teachers and 11,529 private school teachers participated in the teacher survey.

The public school sample was selected from the Quality Education Data (QED) file of public schools. All public schools in the file were stratified by state and by three grade levels (elementary, secondary, and combined). Within each stratum, the schools were sorted by urbanicity, zip code, highest grade in the school, and enrollment. For each stratum within the state, sample schools were selected by systematic sampling with probability proportional to the square root of the number of teachers within a school.

The private school sample was selected primarily from the QED file of private schools. To improve coverage, two additional steps were taken. The first step was to update the QED file with current lists of schools from 17 private school associations. All private schools in the file were stratified by state and then by three grade levels (elementary, secondary, and combined) and 13 affiliation groups. Within each stratum, the schools were sorted by urbanicity, zip code, highest grade in the school, and enrollment. For each stratum within each state, sample schools were selected by systematic sampling with probability proportional to the square root of the number of teachers within a school. The second step was to include an area frame sample, contained in 75 Primary Sampling Units (PSU's), each PSU consisting of a county or group of counties. Within each PSU, an attempt was made to find all eligible private schools. A telephone search was made, using such sources as Yellow Pages, religious institutions, local education agencies, chambers of commerce, local government offices, commercial milk companies, and real estate offices. The PSU's were stratified by Census geographic region, Standard Metropolitan Statistical Area status, and private school enrollment. These PSU's were selected from the universe of 2,497 PSU's with probability proportional to the square root of the PSU population. All schools not on the QED file or the lists from the private school associations were eligible to be selected for the area frame sample. Schools in the area frame that could be contacted were sampled with probability proportional to the square root of the number of teachers. A systematic equal probability sample was then drawn from the schools in the area frame that could not be contacted.

The School Administrator Questionnaire was mailed to the administrator of each sampled school in February 1988. Weighted response rates for the School Administrator Questionnaire were 94.4 percent for public school administrators and 79.3 percent for private school administrators. There was no explicit imputation for item nonresponse and for the small number of schools that were found to be missing from QED lists of public schools. The national estimate for public school principals is underestimated because of missing schools.

The weighted response rate for the Private School Questionnaire was 78.6 percent for private schools. The data were weighted to reflect the universe of private schools, and the weights were adjusted for nonresponse. A private school was excluded from the sample if it did not have any students in any of the grades from 1 to 12, if it operated in a private home that was used as a family residence, or if it was undetermined whether it operated in a private home and its enrollment was less than 10 or it had only one teacher.

For more information about this survey, contact:

Charles Hammer or Marilyn M. McMillen
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Bureau of the Census

Current Population Survey

Current estimates of school enrollment, as well as social and economic characteristics of students, are based on data collected in the Census Bureau's monthly survey of about 60,000 households. The monthly Current Population Survey (CPS) sample consists of 629 areas comprising 1,973 counties, independent cities, and minor civil divisions throughout the 50 States and the District of Columbia. The sample was initially selected from the 1980 Census files and is periodically updated to reflect new housing construction.

The monthly CPS deals primarily with labor force data for the civilian noninstitutional population (i.e., excluding military personnel and their families living on post and inmates of institutions). In addition, on October of each year, supplemental questions are asked about highest grade completed, level of current enrollment, attendance status, number and types of courses, degree or certificate objective, and type of organization offering instruction for each member of the household. Information on enrollment status by grade is gathered each October.

The estimation procedure used for the monthly CPS data involves inflating weighted sample results to independent estimates of characteristics of the civilian noninstitutional population in the United States by age, sex, and race. These independent estimates are based on statistics from decennial censuses; statistics on births, deaths, immigration, and emigration; and statistics on the population in the armed services. Generalized standard error tables are in the *Current Population Reports*. The data are subject to both nonsampling and sampling errors.

More information is available in the *Current Population Reports*, Series P-20, or by contacting:

Education and Social Stratification Branch
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233

School Enrollment. Each October, the Current Population Survey (CPS) includes supplemental questions on the enrollment status of the population 3 years old and over. The main sources of nonsampling variability in the responses to the supplement are those inherent in the survey instrument. The question concerning educational attainment may be sensitive for some respondents, who may not want to acknowledge their lack of a high school diploma. The question of current enrollment may not be answered accurately for various reasons. Some respondents may not know current grade information for every student in the household, a problem especially prevalent for households with members in college or in nursery school. Confusion over college credits or hours taken by a student may make it difficult to determine the year in which the student is enrolled. Problems may occur with the definition of nursery school (a group or class organized to provide educational experiences for children) where respondents' interpretations of "educational experiences" vary.

Questions concerning the CPS "School Enrollment" survey may be directed to:

Education and Social Stratification Branch
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233

Total population estimates. The population estimates contained in this report for the 1980s were developed by averaging the results of two methods, both of which use current data to estimate population change since April 1980. The Census Bureau's Composite Method uses vital statistics and school enrollment to estimate the population 0-14 years of age by a variation of Component Method II. For the household population 15 to 64 years old, the method employs a Ratio-Correlation technique in which a multiple correlation estimating equation is applied to the changes in three independent variables (Federal income tax returns, school enrollment, and housing units) to estimate changes in the population.

In the second method (the Administrative Records Method), net internal migration is estimated using individual Federal income tax returns, immigration from abroad is developed from immigration reports, and reported vital statistics are used to account for natural increase. These

two methods are averaged to estimate the household population under 65 years of age. The population under 65 years old in group quarters and the population 65 years old and over are added to the household population to obtain an estimate of the population total for each state.

Estimates of the group quarters population were obtained by adding to the 1980 Census count of nonbarracks group quarters population, the latest survey data on military barracks population plus an allowance for change in the population in major Job Corps centers. The population 65 years old and over was obtained by adding the estimated change in the number of people enrolled under Medicare between April 1, 1980, and the estimate date to the 1980 Census population 65 years old and over. Civilian population estimates were created by subtracting the Armed Forces population from the resident state population estimate. The Armed Forces data were obtained directly from reports of the Departments of the Defense and Transportation showing the number of military personnel assigned to each installation, adjusted where necessary to reflect place of residence.

The procedures used to develop the all-ages estimates have been tested and modified through comparisons with the results of several decennial censuses. The mean difference of the average of the estimates produced by the Composite Method and the Administrative Records Method for April 1, 1980, from the 1980 census counts was 1.1 percent, with the greatest deviation being 10.1 percent in the District of Columbia. A more detailed description of the population estimates methodology and an indication of their accuracy may be found in *Current Population Reports*, Series P-25, No. 957, published by the U.S. Department of Commerce, Bureau of the Census.

Population estimates by age. The methodology used to develop the age estimates is a variation of Component Method II, one of the methods formerly used to estimate the total population of states. This method involves using the 1980 Census data as a base for each of the age groups by state and taking into account changes in the population attributed to births, deaths, and net migration from April 1, 1980, to the estimate date.

The migration component was derived by using changes in the school enrollment data for each state to estimate a school-age migration rate, which was then converted to a rate for other age groups under 65.

The natural change component makes use of the number of registered births and deaths by state of residence for the calendar years provided by state health departments, adjusted to cover the periods from April 1 to July 1 and adjusted to independent national controls.

As in the all-ages procedure, estimates for the population 65 years old and over were developed using the change measured in Medicare records for each state.

As a final step, the estimates of the age groups for each state were adjusted to sum to the independently estimated resident population total for the state. In addition, the state estimates for each age group were adjusted to be consistent with an independent national population estimate for that age group.

Questions concerning the "Population Estimates" may be directed to:

State and Local Estimates Branch
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233

State population projections. These projections are available in *Current Population Reports, Projections of the Population of States, by Age, Sex, and Race: 1988 to 2010*, Series P-25, No. 1017, published by the Bureau of the Census. They were prepared using a cohort component method whereby each component of population change—births, deaths, domestic inmigration, domestic outmigration, international inmigration, and international outmigration—is projected separately for each birth cohort by sex and race. The basic framework is the same as in past projections and includes the major innovations introduced in *Current Population Reports*, Series P-25, No. 1017. The major innovations include:

1. The projection of annual population by single years of age instead of the projections by 5-year age groups for every fifth year;

2. The use of state-to-state migration flows rather than net migration, or gross immigration and outmigration;

3. The tying of migration projections to the administration data used in the state current population estimates program to provide more recent information as well as the possibility of updating the migration data during the intercensal period;

4. A time series analysis of recent annual trends in migration streams to add a dynamic element to migration projections, rather than the past practice of holding migration rates constant;

5. The use of state differentials in survival rates based on the 1980 decennial life tables; and

6. The use of state differentials in the timing patterns of fertility based on 1980 birth and population data.

where:

The cohort-component method is based on the traditional demographic accounting system:

$P_1 = P_0 + B - D + DIM - DOM + IIM - IOM$

P_1 = population at the end of the period

P_0 = population at the beginning of the period

B = births during the period

D = deaths during the period

DIM = domestic immigration during the period

DOM = domestic outmigration during the period

IIM = international immigration during the period

IOM = international outmigration during the period

In order to generate population projections with this model, one needs separate data for each of these components. In general, the assumptions concerning the future levels of fertility, mortality, and international immigration are consistent with the assumptions developed for the national population projections published in *Current Population Reports*, Series P-25, No. 1018.

Once the data for each of the components have been developed, it is a relatively straightforward process to apply the cohort-component method and produce the projections. For each projection year, the base population for each state is disaggregated into the three racial categories (white, black, and other races), by sex and single years of age (age 0 to 85 and over). The next step is to survive each age-sex-race group forward 1 year using the pertinent survival rate. The internal redistribution of the population is accomplished by applying the appropriate state-to-state migration rates to the survived population in each state. The projected outmigrants are subtracted from the state of origin and added to the state of destination (as inmigrants). The appropriate number of immigrants from abroad is then added to each group. The population under age 1 is created by applying the appropriate age-specific birth rates to the females of childbearing age. The number of births by sex and race are survived forward and exposed to the appropriate migration rates to yield the population under age 1. As a last step, the final results of the projection process are adjusted to be consistent with the national population projections by single years of age, sex, and race.

Questions concerning the state population projections may be directed to:

Population Projections Branch
Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233

Other Sources

National Education Association

Estimates of School Statistics

The National Education Association (NEA) reports teacher, revenue, and expenditure data in its annual publication, *Estimates of School Statistics*. Each year, NEA prepares regression-based estimates of financial and other education statistics and submits them to the states for verification. Generally, about 30 states adjust these estimates based on their own data. These preliminary data are published by NEA along with revised data from previous years. States are asked to revise previously submitted data as final figures become available. The most recent publication contains all changes reported to the NEA.

Some expenditure projections use revised estimates of financial data prepared by NEA because this organization was the most current source. Since expenditure data reported to NCES must be certified for use in Department of Education formula grant programs (such as Chapter 1 of the Education Consolidation and Improvement Act), NCES data are not available as soon as NEA estimates.

Further information on NEA surveys can be obtained from:

National Education Association--Research
1201 16th Street NW
Washington, DC 20036

The WEFA Group

The WEFA Group is the result of the 1987 merger of two leading international consulting firms, Wharton Econometric Forecasting Associates and Chase Econometrics. The WEFA Group provides professional and consulting support on such diverse topics as the Soviet agricultural outlook and U.S. real estate development potential. The U.S. Economic Services of The WEFA Group cover all aspects of the U.S. economy, with particular emphasis on monetary and fiscal policy, financial markets, industrial and consumer markets, industry performance, inflation and long-term movements in energy, interindustry relationships, and demographics.

Additional information is available from:

The WEFA Group
401 City Avenue
Suite 300
Bala Cynwyd, PA 19004

Appendix E

Glossary

Data Terms

Associate degree: A degree granted for the successful completion of a subbaccalaureate program of studies, usually requiring at least 2 years (or the equivalent) of full-time college-level study. This term includes degrees granted in a cooperative or work- study program.

Average daily attendance (ADA): The aggregate attendance of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered days in session.

Average daily membership (ADM): The aggregate membership of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered as days in session. The average daily membership for groups of schools having varying lengths of terms is the average of the average daily memberships obtained for the individual schools.

Bachelor's degree: A degree granted for the successful completion of a baccalaureate program of studies, usually requiring at least 4 years (or the equivalent) of full-time college-level study. This term includes degrees granted in a cooperative or work–study program.

Classroom teacher: A staff member assigned the professional activities of instructing pupils in self-contained classes or courses, or in classroom situations. Usually expressed in full-time-equivalents.

Class size: The membership of a class at a given date.

Cohort: A group of individuals that have a statistical factor in common, for example, year of birth.

College: A postsecondary school that offers a general or liberal arts education, usually leading to an associate, bachelor's, master's, doctor's, or first-professional degree. Junior colleges and community colleges are included in this term.

Constant dollars: Dollar amounts that have been adjusted by means of price and cost indexes to eliminate inflationary factors and allow direct comparison across years.

Consumer Price Index (CPI): This price index measures the average change in the cost of a fixed market basket of goods and services purchased by consumers.

Current dollars: Dollar amounts that have not been adjusted to compensate for inflation.

Current expenditures (elementary/secondary): The expenditures for operating local public schools, excluding capital outlay and interest on school debt. These expenditures include such items as salaries for school personnel, fixed charges, student transportation, school books and materials, and energy costs.

Current expenditures per pupil in average daily attendance: Current expenditures for the regular school term divided by the average daily attendance of full-time pupils (or full-time-equivalency of pupils) during the term. See also *current expenditures* and *average daily attendance*.

Current Population Survey: See Appendix D, Data Sources.

Disposable personal income: Current income received by persons less their contributions for social insurance, personal tax, and nontax payments. It is the income available to persons for spending and saving. Nontax payments include passport fees, fines and penalties, donations, and tuitions and fees paid to schools and hospitals operated mainly by the Government. See also *personal income*.

Doctor's degree: An earned degree carrying the title of doctor. The Doctor of Philosophy degree (Ph.D.) is the highest academic degree and requires mastery within a field of knowledge and demonstrated ability to perform scholarly research. Other doctorates are awarded for fulfilling specialized requirements in professional fields, such as education (Ed.D.), musical arts (D.M.A.), business administration (D.B.A.), and engineering (D.Eng. or D.E.S.). Many doctor's degrees in both academic and professional fields require an earned master's degree as a prerequisite. First-professional degrees, such as M.D. and D.D.S., are not included under this heading.

Elementary school: A school classified as elementary by State and local practice and composed of any span of

grades not above grade 8. A preschool or kindergarten school is included under this heading only if it is an integral part of an elementary school or a regularly established school system.

Elementary and secondary schools: As used in this publication, includes only regular schools, that is, schools that are part of State and local school systems and also most not-for-profit private elementary and secondary schools, both religiously affiliated and nonsectarian. Schools not included in this term are subcollegiate departments of institutions of higher education, American residential schools for exceptional children Federal schools for Indians, and Federal schools on military posts and other Federal installations.

Enrollment: The number of students registered in a given school unit at a given time, generally in the fall of a year.

Expenditures: Charges incurred, whether paid or unpaid, that are presumed to benefit the current fiscal year. For elementary and secondary schools, these include all charges for current outlays plus capital outlays and interest on school debt. For institutions of higher education, these include current outlays plus capital outlays. For government, these include charges net of recoveries and other correcting transactions other than for retirement of debt, investment in securities, or extension of credit. Government expenditures include only external transactions, such as the provision of perquisites or other payments in kind. Aggregates for groups of governments exclude intergovernmental transactions among the governments.

Expenditures per pupil: Charges incurred for a particular period of time divided by a student unit of measure, such as average daily attendance or average daily membership.

First-professional degree: A degree that signifies both completion of the academic requirements for beginning practice in a given profession and a level of professional skill beyond that normally required for a bachelor's degree. This degree usually is based on a program requiring at least 2 academic years of work before entrance and a total of at least 6 academic years of work to complete the degree program, including both prior required college work and the professional program itself. By NCES definition, first-professional degrees are awarded in the fields of dentistry (D.D.S or D.M.D.), medicine (M.D.), optometry (O.D.), osteopathic medicine (D.O.), pharmacy (D.Phar.), podiatric medicine (D.P.M.), veterinary medicine (D.V.M.), chiropractic (D.C. or D.C.M.), law (LL.B. or J.D.), and theological professions (M.Div. or M.H.L.).

First-professional enrollment: The number of students enrolled in a professional school or program that requires at least 2 years of academic college work for entrance and a total of at least 6 years for a degree. By NCES definition, first-professional enrollment includes only students in certain programs. (See *first-professional degree* for a list of programs.)

Full-time enrollment: The number of students enrolled in higher education courses with total credit load equal to at least 75 percent of the normal full-time course load.

Full-time-equivalent (FTE) enrollment: For institutions of higher education, enrollment of full-time students, plus the full-time equivalent of part-time students as reported by institutions. In the absence of an equivalent reported by an institution, the FTE enrollment is estimated by adding one-third of part-time enrollment to full-time enrollment.

Full-time worker: In educational institutions, an employee whose position requires being on the job on school days throughout the school year at least the number of hours the schools are in session; for higher education, a member of an educational institution's staff who is employed full time.

Graduate: An individual who has received formal recognition for the successful completion of a prescribed program of studies.

Graduate enrollment: The number of students who hold the bachelor's or first-professional degree, or the equivalent, and who are working toward a master's or doctor's degree. First-professional students are counted separately. These enrollment data measure those students who are registered at a particular time during the fall. At some institutions, graduate enrollment also includes students who are in postbaccalaureate classes but not in degree programs.

Higher education: Study beyond secondary school at an institution that offers programs terminating in an associate, baccalaureate, or higher degree.

Higher education institutions (traditional classifications):

4-year institution: An institution legally authorized to offer and offering at least a 4-year program of college-level studies wholly or principally creditable toward a bachelor's degree. A university is a postsecondary institution that typically includes one or more graduate professional schools.

2-year institution: An institution legally authorized to offer and offering at least a 2-year program of college-level studies that terminates in an associate degree or is principally creditable toward a baccalaureate.

High school: A secondary school offering the final years of high school work necessary for graduation, usually including grades 10, 11, and 12 (in a 6-3-3 plan), or grades 9, 10, 11, and 12 (in a 6-2-4 plan).

Instructional staff: Full-time-equivalent number of positions, not the number of individuals occupying the positions during the school year. In local schools, it includes all public elementary and secondary (junior and senior high) day-school positions that are in the nature of teaching or the improvement of the teaching learning situation. Includes consultants or supervisors of instruction, principals, teachers, guidance personnel, librarians, psychological personnel, and other instructional staff. Excludes administrative staff, attendance personnel, clerical personnel, and junior college staff.

Master's degree: A degree awarded for successful completion of a program generally requiring 1 or 2 years of full-time college-level study beyond the bachelor's degree. One type of master's degree, including the Master of Arts degree (M.A.) and the Master of Science degree (M.S.) is awarded in the liberal arts and sciences for advanced scholarship in a subject field or discipline and demonstrated ability to perform scholarly research. A second type of master's degree is awarded for the completion of a professionally oriented program, for example, an M.Ed. in education, an M.B.A. in business administration, an M.F.A. in fine arts, an M.M. in music, an M.S.W. in social work, or an M.P.A. in public administration. A third type of master's degree is awarded in professional fields for study beyond the first-professional degree, for example, the Master of Laws (LL.M.) and Master of Science in various medical specializations.

Newly qualified teacher: A person who (1) first became eligible for a teaching license during the period of the study referenced or who was teaching at the time of the survey but was not certified or eligible for a teaching license and (2) had never held a full-time, regular (as opposed to substitute) teaching position before completing the requirements for the degree that brought the person into the survey.

Nonresident alien: A person who is not a citizen of the United States and who is in this country on a temporary basis and does not have the right to remain indefinitely.

Part-time enrollment: The number of students enrolled in higher education courses with a total credit load of less than 75 percent of the normal full-time credit load.

Personal income: Current income received by persons from all sources minus their personal contributions for social insurance. Classified as "persons" are individuals (including owners of unincorporated firms), nonprofit institutions serving individuals, private trust funds, and private noninsured welfare funds. Personal income includes transfers (payments not resulting from current production) from government and business such as social security benefits, military pensions, and so forth, but excludes transfers among persons.

Postbaccalaureate enrollment: The number of graduate and first-professional students working toward advanced degrees and students enrolled in graduate-level classes but not enrolled in degree programs. See also *graduate enrollment* and *first-professional enrollment*.

Private institution: A school or institution that is controlled by an individual or agency other than a State, a subdivision of a State, or the Federal Government; that is usually supported primarily by other than public funds; and the operation of whose program rests with other than publicly elected or appointed officials.

Property tax: The sum of money collected from a tax levied against the value of property.

Public school or institution: A school or institution controlled and operated by publicly elected or appointed officials and deriving its primary support from public funds.

Pupil–teacher ratio: The enrollment of pupils at a given period of time, divided by the full-time-equivalent number of classroom teachers serving these pupils during the same period.

Racial–ethnic group: A classification indicating general racial or ethnic heritage based on self-identification, as in data collected by the Bureau of the Census, or on observer identification, as in data collected by the Office of Civil Rights. These categories are in accordance with the Office of Management and Budget standard classification scheme presented below:

White: A person having origins in any of the original peoples of Europe, North Africa, or the Middle East. Normally excludes persons of Hispanic origin, except for tabulations produced by the Bureau of the Census, which are noted accordingly in this volume.

Black: A person having origins in any of the black racial groups in Africa. Normally excludes persons of Hispanic origin, except for tabulations produced by the Bureau of the Census.

Hispanic: A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

Asian or Pacific Islander: A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.

This area includes, for example, China, India, Japan, Korea, the Philippine Islands, and Samoa.

American Indian/Alaskan Native: A person having origins in any of the original peoples of North America and maintaining cultural identification through tribal affiliation or community recognition.

Revenues: All funds received from external sources, net of refunds and correcting transactions. Noncash transactions such as receipt of services, commodities, or other receipts "in kind" are excluded, as are funds received from the issuance of debt, liquidation of investments, or nonroutine sale of property.

Revenues receipts: Additions to assets that do not incur an obligation that must be met at some future date and do not represent exchanges of property for money. Assets must be available for expenditures.

Salary: The total amount regularly paid or stipulated to be paid to an individual, before deductions, for personal services rendered while on the payroll of a business or organization.

School: A division of the school system consisting of students in one or more grades or other identifiable groups and organized to give instruction of a defined type. One school may share a building with another school or one school may be housed in several buildings.

Secondary instructional level: The general level of instruction provided for pupils in secondary schools (generally covering grades 7 through 12 or 9 through 12) and any instruction of a comparable nature and difficulty provided for adults and youth beyond the age of compulsory school attendance.

Secondary school: A school including any span of grades beginning with the next grade following an elementary or middle school (usually 7, 8, or 9) and ending with or below grade 12. Both junior high schools and senior high schools are included.

Senior high school: A secondary school offering the final years of high school work necessary for graduation.

Student: An individual for whom instruction is provided in an educational program under the jurisdiction of a school, school system, or other educational institution. No distinction is made between the terms "student" and "pupil," although 'student' may refer to one receiving instruction at any level while "pupil" refers only to one attending school at the elementary or secondary level. The term "student" is used to include individuals at all instructional levels. A student may receive instruction in a school facility or in another location, such as at home or in a hospital. Instruction may be provided by direct student-teacher interaction or by some other approved medium, such as television, radio, telephone, or correspondence.

Tax base: The collective value of objects, assets, and income components against which a tax is levied.

Total expenditure per pupil in average daily attendance: Includes all expenditures allocable to per pupil costs divided by average daily attendance. These allocable expenditures include current expenditures for regular school programs, interest on school debt, and capital outlay. Beginning in 1980-81, expenditures for by administration by state governments are excluded and expenditures for other programs (summer schools, community colleges, and private schools) are included.

Unclassified students: Students who are not candidates for a degree or other formal award, although they are taking higher education courses for credit in regular classes with other students.

Undergraduate students: Students registered at an institution of higher education who are working in a program leading to a baccalaureate or other formal award below the baccalaureate, such as an associate degree.

Statistical Terms

Auto-Correlation: Correlation of the error terms from different observations of the same variable. Also called *serial correlation.*

Degrees of freedom: The number of free or linearly independent sample observations used in the calculation of a statistic.

Dependent variable: A mathematical variable whose value is determined by that of one or more other variables in a function. In regression analysis, when a random variable, y, is expressed as a function of variables x_1, x_2,..... plus a stochastic term, the y is known as the "dependent variable."

Double exponential smoothing: A method that takes a single smoothed average component of demand and smoothes it a second time to allow for estimation of a trend effect.

Durbin-Watson statistic: A statistic testing the independence of errors in least squares regression against the alternative of first-order serial correlation. The statistic is a simple linear transformation of the first-order serial correlation of residuals and, although its distribution is unknown, it is tested by bounding statistics that follow R. L. Anderson's distribution.

Econometrics: The quantitative examination of economic trends and relationships using statistical techniques, and the development, examination, and refinement of those techniques.

Estimate: A numerical value obtained from a statistical sample and assigned to a population parameter. The particular value yielded by an estimator in a given set of circumstances or the rule by which such particular values are calculated.

Estimating equation: An equation involving observed quantities and an unknown that serves to estimate the latter.

Estimation: Estimation is concerned with inference about the numerical value of unknown population values from incomplete data, such as a sample. If a single figure is calculated for each unknown parameter, the process is called point estimation. If an interval is calculated within which the parameter is likely, in some sense, to lie, the process is called interval estimation.

Exogenous variable: Variables for which the values are determined outside the model but which influence the model.

Exponential smoothing: A method used in time series to smooth or to predict a series. There are various forms, but all are based on the supposition that more remote history has less importance than more recent history.

Ex-Ante forecast: When forecasting a dependent variable for some time period t using a model with at least one independent variable, the forecast of the dependent variable is an ex-ante forecast if the values for the independent variables for time period t are themselves not known.

Ex-Post forecast: When forecasting a dependent variable for some time period t using a model with at least one independent variable, the forecast of the dependent variable is an ex-post forecast if the values for the independent variables for time period t are the actual values. Ex-post forecasts are often used in forecast evaluation.

First-Order serial correlation: When errors in one time period are correlated directly with errors in the ensuing time period. Also called *auto-correlation.*

Forecast: An estimate of the future based on rational study and analysis of available pertinent data, as opposed to subjective prediction.

Forecasting: Assessing the magnitude which a quantity will assume at some future point in time; as distinct from "estimation," which attempts to assess the magnitude of an already existent quantity.

Forecast horizon: The number of time periods into the future which are forecasted. Forecasts for next year are said to have a 1-year forecast horizon.

Function: A mathematical correspondence that assigns exactly one element of one set to each element of the same or another set. A variable that depends on and varies with another.

Functional form: A mathematical statement of the relationship among the variables in a model.

Independent variable: In regression analysis, when a random variable, y, is expressed as a function of variables x_1, x_2,..... plus a stochastic term, the x's are known as "independent variables."

Lag: An event occurring at time $t + k$ $(k > 0)$ is said to lag behind an event occurring at time t, the extent of the lag being k. An event occurring k time periods before another may be regarded as having a negative lag.

Maximum likelihood estimation: A method of estimating a parameter or parameters of a population by

that value (or values) that maximizes (or maximize) the likelihood of a sample.

Mean absolute percentage error (MAPE): The average value of the absolute value of errors expressed in percentage terms.

Model: A system of postulates, data, and inferences presented as a mathematical description of a phenomenon such as an actual system or process. The actual phenomenon is represented by the model in order to explain it, to predict it, and to control it.

Ordinary least squares (OLS): The estimator that minimizes the sum of squared residuals.

Parameter: A quantity that describes a statistical population.

Projection: In relation to a time series, an estimate of future values based on a current trend.

R^2: The coefficient of determination; the square of the correlation coefficient between the dependent variable and its OLS estimate.

$\bar{R}^2$(also called the adjusted R^2): The coefficient of determination adjusted for the degrees of freedom.

Regression analysis: A statistical technique for investigating and modeling the relationship between variables.

Rho: A measure of the correlation coefficient between errors in time period t and time period t minus 1.

Serial correlation: Correlation of the error terms from different observations. Also called *auto-correlation*.

Standard error of estimate: An expression for the standard deviation of the observed values about a regression line. An estimate of the variation likely to be encountered in making predictions from the regression equation.

Time series: A set of ordered observations on a quantitative characteristic of an individual or collective phenomenon taken at different points in time. Usually the observations are successive and equally spaced in time.

Time series analysis: The branch of quantitative forecasting in which data for one variable are examined for patterns of trend, seasonality, and cycle.

Variable: A quantity that may assume any one of a set of values.

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