



# Economic Returns from Higher Education in Texas

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## 1.0 Introduction

The Morrill Act of 1862, federal legislation passed 135 years ago in the midst of the Civil War, was intended to broaden access to higher education among different socio-economic classes. This initiative was motivated in large part by the realization that the benefits of higher education were not confined to the individual, but shared by all of society, a fact that still holds true. Unfortunately, the modern higher education sector<sup>1</sup> is facing economic and technical challenges to its ability to deliver on this long-standing social contract.

Colleges and universities throughout the nation are in a state of fiscal crisis due to several converging economic and demographic forces. Demand for postsecondary education has grown dramatically in the past several decades and is expected to continue rising in the foreseeable future. At the same time, higher education costs are increasing and the relative amount of support from all levels of government has remained stagnant. In order to remain financially viable, higher education institutions have been forced to increase tuition and fees and to explore various cost-cutting measures, which could threaten the quality of educational services. As a result of these cost factors, an increasing percentage of low-income high school graduates are either deferring or altogether forgoing postsecondary education.

A basic premise of this report is that postsecondary education of qualified individuals is both inherently cost-effective and necessary for the continued economic prosperity of this nation and state. The accelerating role of information as a fourth factor of economic production (in addition to land, labor, and capital) places an even greater emphasis on increasing the educational attainment levels of the Texas labor force. A high school diploma no longer represents the vehicle to economic prosperity that it did to previous generations, as those whose education stops at this point can actually expect to see their real wages decline over time.

In simple terms, the ability to acquire and process information has become the primary determinant of economic well being in the modern economy. Education levels are a proxy for this ability. As the data presented later in the report clearly shows, there is a strong correlation between higher educational attainment and earnings levels. The principal purpose of this report, therefore, is to illustrate the potential economic gains — both to the individual and to Texas as a whole — associated with increasing the levels of higher educational attainment. Section 2 considers several recent trends in higher education costs and financing which have helped precipitate this apparent fiscal crisis. Section 3 discusses how higher education affects the individual directly, focusing on the increased wages and reduced unemployment probability that can be expected with additional study or training. Section 4 reviews the current conditions relevant to higher education in Texas. Finally, Section 5 provides empirical estimates for the state and its metropolitan areas of the expected impact on the Texas economy of enhanced educational attainment levels.

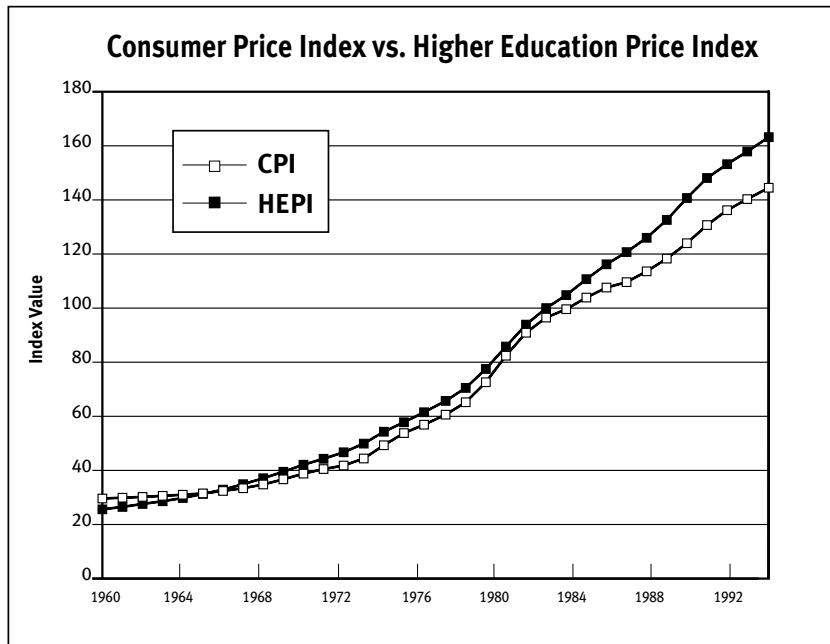
## 2.0 Higher Education Finances

One of the key factors contributing to the fiscal crisis in higher education is escalating costs. As shown in Figure 1, the costs of higher education, as measured by the Higher Education Price Index (HEPI) have been increasing much more rapidly than consumer prices as a whole in recent years.<sup>2</sup>

1 Throughout this report, the term “higher education sector” refers to both public and private institutions of postsecondary education and training, including two- and four-year colleges and universities, community colleges and technical schools.

2 The Higher Education Price Index is compiled by Research Associates of Washington, Washington, D.C. The HEPI measures the average changes over time in prices for a fixed bundle of goods and services employed by higher education institutions to support current operations.

Figure 1



Source: Derived from data in Table 37, 1996 Digest of Educational Statistics, published by the U.S. Department of Education, National Center for Educational Statistics (NCES). Data obtained from the NCES web site at: <http://nces.ed.gov/pubs/d96/>

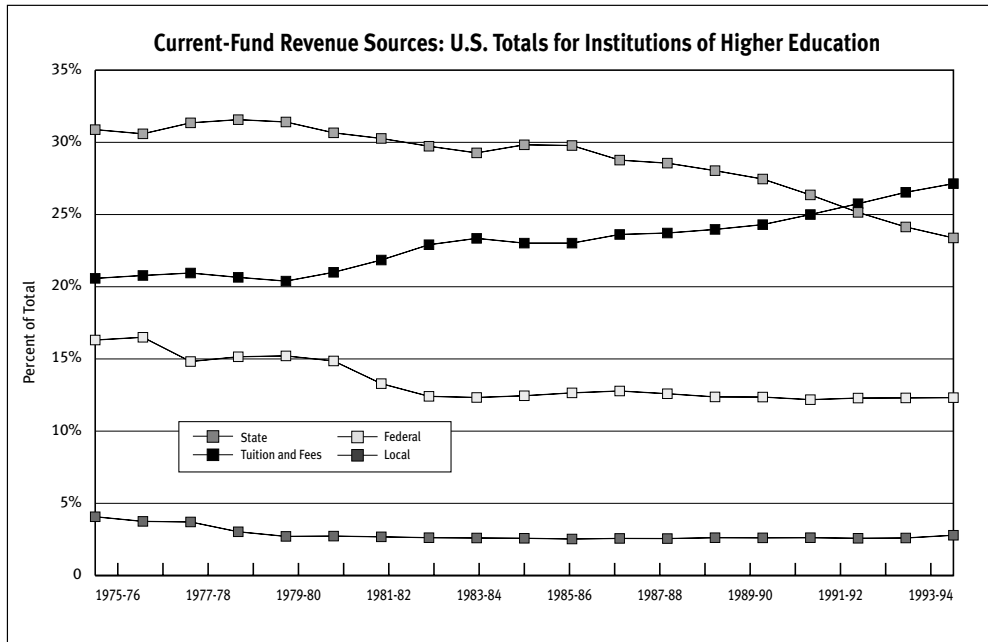
Throughout the 1960s and 1970s, these two indices followed roughly the same path. The 1970s, a generally inflationary period, saw average annual increases of 7.9 and 7.4 percent for the Consumer Price Index (CPI) and HEPI, respectively. Beginning in the early 1980s, however, consumer prices began falling off from their 1970s pace, but higher education costs continued along substantially the same higher 1970s trend line. By 1993, consumer prices were 59 percent higher than they had been in 1981, while higher education costs had risen by 74 percent.

Who is picking up these additional costs for higher education? More and more, the burden is falling on individual students and their families. The relative contributions of major sources of current-fund revenues for all institutions of higher education in the United States for the past two decades are shown in Figure 2.

The proportional significance of federal, state and local government contributions to current-fund revenues has remained quite stable since the early 1980s, at about 12 and 3 percent, respectively. The share provided by state governments has been steadily eroding, from 30.9 percent in 1975 to 25.8 percent in 1993. Student-supplied funds, on the other hand, have been increasing regularly, from 20.6 percent of the total in 1975 to 27.1 percent in the 1993 school year.

To put this into perspective, students in 1993 paid almost \$12 billion more in tuition and fees than they would have had their relative contribution rates remained at 1975 levels. On average, this amounts to roughly an additional \$1,000 per year per full-time equivalent student. Overall, tuition and fees now represent the single largest source of current-fund revenues for higher education institutions.

Figure 2



Source: Derived from data in Table 324, 1996 Digest of Educational Statistics, published by the U.S. Department of Education, National Center for Educational Statistics (NCES). Data obtained from the NCES web site at: <http://nces.ed.gov/pubs/d96/>

During this entire period, current-fund revenues increased at an average annual rate of 8.8 percent, from \$40 million to \$179 million. Tuition and fees rose 10.4 percent annually, accounting for almost 30 percent of the \$139 million increase and representing a six-fold increase over the period. Contributions from all levels of government grew just 7 percent per year and provided about 35 percent of the increased funding.

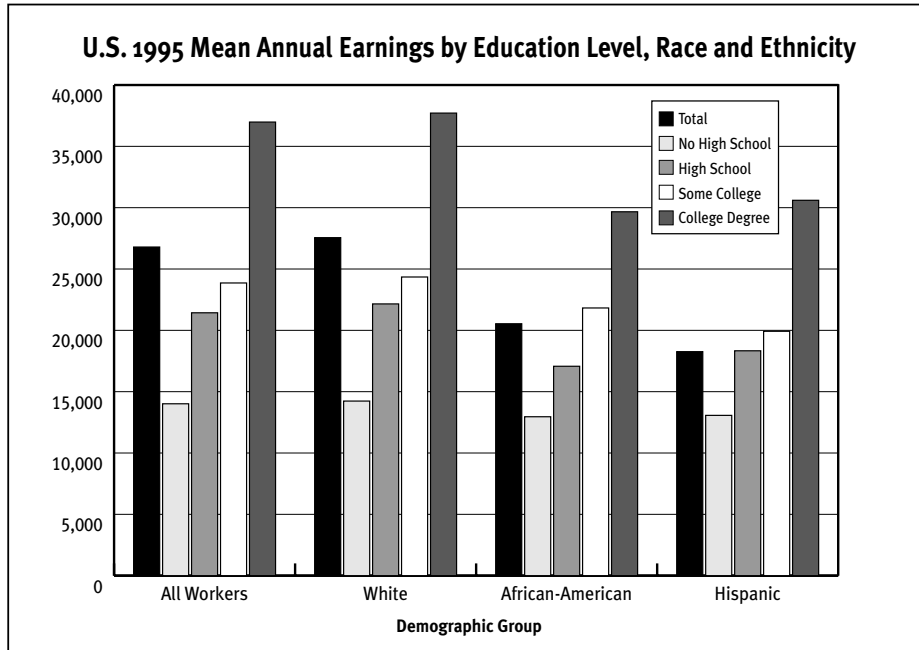
Clearly, more of the burden of financing higher education has been steadily shifting to individual students and families of students over the past two decades. This trend can only serve to depress enrollment rates and decrease the aggregate individual and collective benefits, which can be expected from higher education in this country.

### 3.0 Private Returns from Higher Education

A considerable body of research shows that postsecondary education can have a significant impact on the wages an individual can command in the marketplace. For example, Figure 3 shows estimated mean 1995 earnings for all workers and different demographic groups according to educational attainment level, as reported by the U.S. Bureau of the Census.

In 1995, a typical worker of any age who had received just a high school degree earned about \$21,400. In comparison, all workers (including those with no high school and those with advanced degrees) earned about 25 percent more at \$26,800. College graduates collected \$37,000 on average, or about 73 percent more than a high school graduate did.

Figure 3



Source: Based on U.S. Bureau of the Census, Current Population Survey, March 1996.

When demographic subgroups are examined separately these same kinds of relative relationships generally hold true, although whites typically earn anywhere from 10 to 30 percent more than either African-Americans or Hispanics at all educational levels. The effects on the Texas economy of bringing African-Americans and Hispanics up to the educational attainment levels of whites are considered later in this report.

This data can also be used to estimate “productivity factors” for different educational attainment levels, based on the assumption that labor markets are efficient. That is, if one worker earns 50 percent more than another, and if labor markets are efficient in translating the marginal product of workers into increased compensation, then that worker can be assumed to be 50 percent more productive than the other.<sup>3</sup>

These calculations are presented in Table 1 for the period 1990 to 1995. On this basis, those with college degrees were, on average, 76 percent more productive than those with just a high school degree. The value of postsecondary education is further reinforced by the fact that all workers, including in that group even those who had not received a high school degree, still earned about 25 percent more than high school graduates.

<sup>3</sup> These kinds of productivity factors are central to the calculation below of economic benefits from higher education to the Texas economy. The question asked there is how different would that economy be if all minorities could be brought up to the same educational attainment levels as whites, assuming that this would translate into corresponding productivity and wage increases. Of course, race- and ethnicity-based salary differentials are not entirely due to differences in education, but that is a matter beyond the scope of this study.

**Table 1**  
Productivity Factors: Ratios of U.S. Mean Annual Salaries by Education Level

Year	All Workers to High School Graduates	College Graduates to High School Graduates
1990	1.22	1.75
1991	1.22	1.72
1992	1.24	1.74
1993	1.27	1.81
1994	1.28	1.84
1995	1.25	1.73
Mean:	1.25	1.76

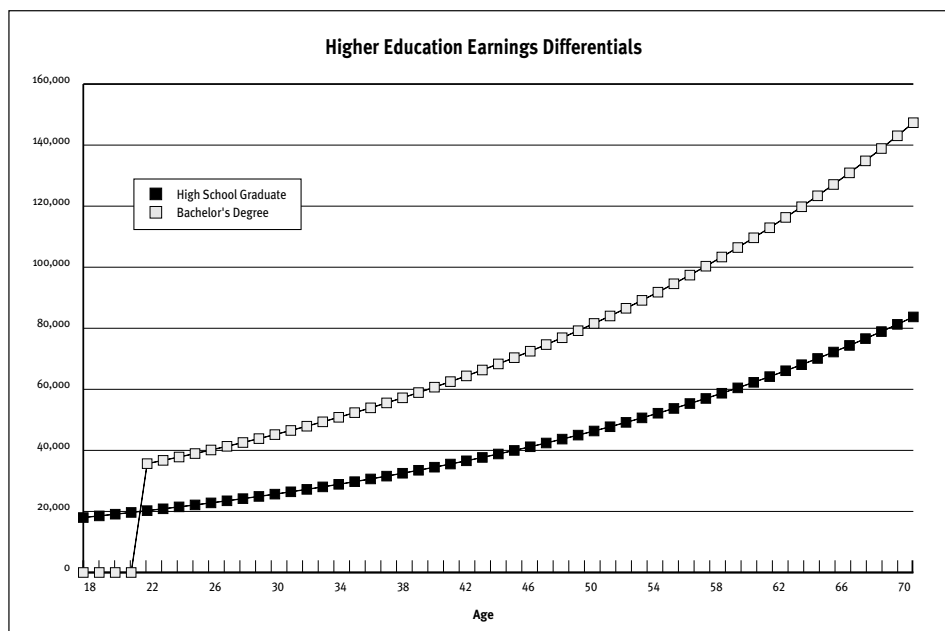
Source: Based on U.S. Bureau of the Census, Current Population Survey, March 1996.

Another way of looking at these data is how they would theoretically impact on an individual's lifetime earnings profile. Figure 4 accomplishes this, relying on several simplifying assumptions.

For the purposes of this example, it was assumed that a high school graduate is confronted with the choice of accepting a job offering a beginning salary of \$18,000 per year or entering a four-year college program. At the conclusion of that program, the college graduate could expect to earn a salary 1.76 times greater than the high school graduate, a multiplier based on the productivity factors presented earlier.

Both of these salary streams are assumed to increase at the rate of 3 percent annually to adjust for inflation, and the individual will work until the age of 70. In addition, the college enrollee is assumed not to work during his matriculation period, and to incur additional expenses of \$10,000 per year during those four years. Finally, the real time value of money is taken to be 3 percent, producing a total discount rate of 6 percent.

**Figure 4**



Under these conditions, the net present value of the additional earnings from obtaining a college degree is just over \$207,000. In theory, this represents the maximum amount the individual should be willing to pay for that college degree, an amount that is far in excess of the typical costs of a four-year degree program.

Forgoing higher education may also mean much more than simply forgoing these additional earnings possibilities. Because of the changing skill requirements of the economy, those who fail to pursue postsecondary education are threatened with pronounced decline in their real wages over time. A recent study by the Commission on National Investment in Higher Education looked at the relationship between education level and trends in wages and family income from 1976 through 2015.<sup>4</sup> Among the conclusions of the study's analysis were:

- A much larger proportion of the population will fall below the standard of living considered average today.
- The real hourly wages of the average male worker will decline by about 25 percent compared to what the average male earned in the 1970s. For those near the bottom of the wage distribution, hourly earnings will slip by about 44 percent.
- While family incomes in the highest earning bracket will increase by 50 percent, the earnings of the poorest families will decline by about 36 percent from the levels of comparable families in 1976, creating an unprecedented income gap between the nation's rich and poor.
- College education will not be equally distributed among ethnic/racial groups, creating little chance for underrepresented groups to improve their standard of living. As a result, the educational and economic fault lines in the United States will be drawn increasingly in terms of ethnicity and race.

These trends all point towards much greater income disparity in the future unless education levels are increased for those at the lower end of the wage distribution. The Commission further reported that in 1976 families at the 90th percentile of the income distribution enjoyed incomes nine times larger than those at the 10th percentile. By 1993, the ratio was 12, and if current trends persist this income disparity is expected to be in excess of 16 to one by 2015.

Statistics also show that increased education provides the individual with a buffer against the prospect of unemployment. According to data from the National Center for Education Statistics (see Table 2), 1995 unemployment rates uniformly decreased for persons 25 years of age or older as their education levels increased. Those with at least a bachelor's degree had an unemployment rate that was half that of high school graduates and about one-fourth that of those who had not completed high school. Predictably, younger workers had somewhat larger unemployment rates, but increased education generally had the same effect of reducing the likelihood of unemployment.

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<sup>4</sup> "Breaking the Social Contract: The Fiscal Crisis in Higher Education," Commission on National Investment in Higher Education, 1996. The text of this summary report is available online at: <http://www.rand.org/publications/CAE/CAE100/index.html>

**Table 2**  
Percent Unemployed: 1995 (1)

Level of Educational Attainment	Age		
	16-19(2)	20-24 (2)	≥25
All education levels	17.3	9.1	4.3
Less than a high school graduate	20.8	18.6	9.0
High school graduate, no college	14.7	10.8	4.8
Some college, no degree	8.4	6.3	4.3
Associate degree	11.2	5.1	3.3
Bachelor's degree or higher	6.5	5.5	2.4

(1) The unemployment rate is the percent of individuals in the labor force who are not working and who made specific efforts to find employment sometime during the prior four weeks. The labor force includes both employed and unemployed persons.

(2) Excludes persons enrolled in school.

Source: Derived from data in Table 374, 1996 Digest of Educational Statistics, published by the U.S. Department of Education, National Center for Educational Statistics (NCES). Data obtained from the NCES web site at: <http://nces.ed.gov/pubs/d96/>

While the preceding statistics and analyses relate primarily to the prospects for individual improvement through increased education, there are also profound social ramifications associated with these trends. Reduced income disparities can only reduce social tensions and broaden opportunities for all social groups. Lower rates of unemployment mean less reliance on public assistance and a stronger economic base. The substantial direct and indirect economic benefits from higher levels of educational attainment are considered more thoroughly below.

## 4.0 Conditions in Texas

By July 1996, the population of the state of Texas had increased by more than 2.1 million persons, or 12.6 percent, over April 1990 levels. This represented almost 13 percent of total growth for the nation during that period, while Texas accounted for just 7.2 percent of the U.S. population overall. Much of this growth was due to relocation of persons already in an age bracket which would make them likely candidates for higher education services and young families with children who will soon be at an age to seek postsecondary education. To sustain economic growth in Texas it is imperative that these individuals be able to afford higher education when they are in a position to benefit from it.

### 4.1 Educational Attainment

By almost any relevant measure, Texas has much room for improvement in its higher educational attainment statistics. Texas, the third most populous state, is the fastest-growing state in the country. Texas ranks 42nd in terms of the proportion of its population that is aged 25 or older which has at least a high school degree (76.4 percent) and 29th in terms of the proportion of this group which has completed a bachelor's degree or more (21.9 percent).

The situation is even more unsettling when racial and ethnic backgrounds are examined. African-Americans, some 9 percent of the population aged 25 or older, have about the same high school graduation rate as whites, but only 14.2 percent go on to attain a bachelor's degree or more, versus 22 percent of the white population. Hispanics, a significant and growing percentage of the Texas population, have much lower educational attainment rates: less than half (48.1 percent) have a high school diploma and only 6.9 percent a bachelor's degree or higher.<sup>5</sup> In light of

<sup>5</sup> The preceding statistics are drawn from U.S. Bureau of the Census, Current Population Reports P20-493, Educational Attainment in the United States (March 1996 Update).

these statistics, it is unsurprising that Texas ranks 48th among the states in terms of the percentage of the population below both the poverty line and the median household income.

**4.2 High School Graduation Rates**

One of the first steps in increasing the number of college graduates is decreasing the number of high school dropouts. As Table 3 shows, Texas has made great strides in this area over the last decade. While total 7-12th grade enrollment increased 19 percent during this period to more than 1.6 million students, the number of dropouts actually dropped by two-thirds, to about 30,000.

Substantial improvements were realized across the board, but dropout rates in recent years for Hispanic students are still more than twice those of white students, and their share in total dropouts has grown to about 50 percent. Dropout rates for African-American students are about twice those of white students; their share of the total has remained quite stable over this time period at 17 to 18 percent, but this proportion is still about twice their representation in the Texas population as a whole.

**Table 3**  
Texas High School Dropout Rates

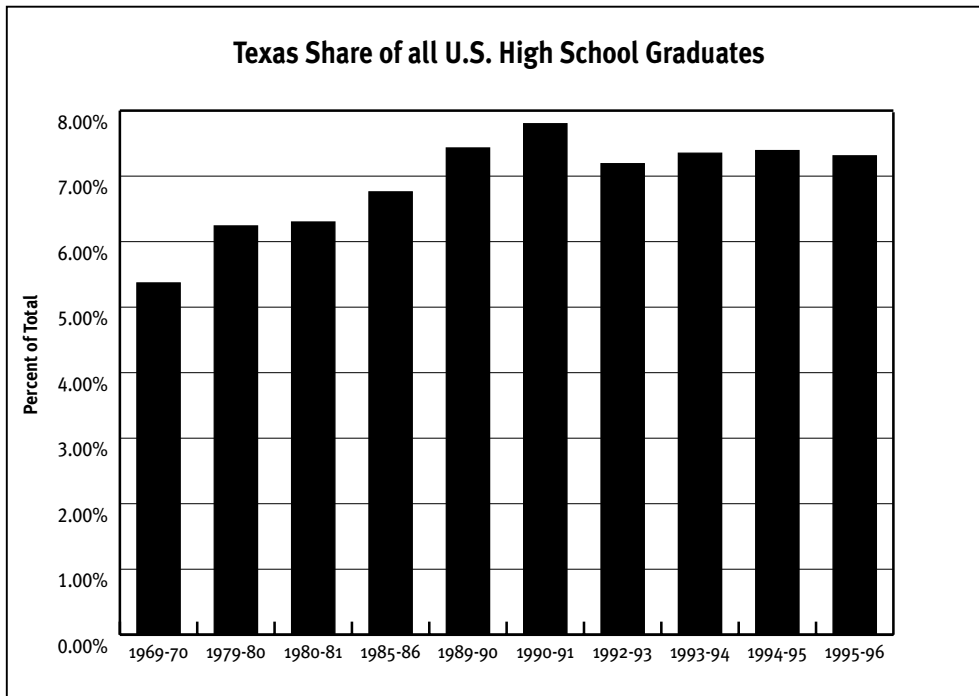
Year	White		African-American		Hispanic		Total	
	Rate (%)	Share (%)	Rate (%)	Share (%)	Rate (%)	Share (%)	Number	Rate (%)
1987-88	5.2	42.0	8.4	17.9	8.8	38.2	91,307	6.7
1988-89	4.5	40.0	7.5	17.6	8.1	40.6	82,325	6.1
1989-90	3.5	35.5	6.8	18.6	7.2	44.1	70,040	5.1
1990-91	2.7	35.1	4.8	17.3	5.6	45.8	53,965	3.9
1991-92	2.5	33.2	4.8	17.5	5.5	47.4	53,421	3.8
1992-93	1.7	30.5	3.6	18.1	4.2	49.6	43,402	2.8
1993-94	1.5	28.7	3.2	17.6	3.9	51.9	40,211	2.6
1994-95	1.2	31.3	2.3	17.1	2.7	49.9	29,918	1.8

Source: Texas Education Agency Public Education Information Management System.

Texas public high schools graduated about 172,000 students in the 1995-96 school year — over 7.3 percent of all public high school graduates nationwide. About 55 percent of these graduates were White, 12 percent African-American and 29 percent Hispanic. As shown in Figure 5, this brings graduation numbers back up to the levels they exhibited at the beginning of the 1980s, and again at the beginning of the 1990s. It is expected that these numbers will grow steadily over the next two decades.



Figure 5



Source: Derived from data in Table 99, 1996 Digest of Educational Statistics, published by the U.S. Department of Education, National Center for Educational Statistics (NCES). Data obtained from the NCES web site at: <http://nces.ed.gov/pubs/d96/>.

Overall, two-thirds of these recent graduates — some 113,000 students — expressed the intention of going on to college. There was only minor variation of this expressed intention by racial or ethnic background. Unfortunately, if historic trends persist, only a fraction of these college hopefuls will be able to follow through, at least in the near future.

Data on the actual percentage of Texas high school graduates who go on to postsecondary education are not readily available, but it is possible to draw some inferences from other published statistics. These data, discussed in the next section, suggest that as little as one-third of these college aspirants will actually enroll as first-time, full-time freshmen in a Texas public university. Perhaps another one-third will be able to enroll as first-time, full-time freshmen in Texas community or technical colleges.

### 4.3 College Enrollment and Graduation Rates

Forecasts by the Texas Higher Education Coordinating Board (THECB) based on current population projections and recent patterns in college and university attendance project an increase in enrollment at Texas institutions of higher education of 12.3 percent in the next 13 years (see Table 4). This represents an absolute increase in enrollments of almost 115,000 students, or about 9,000 students per year. Well over half of this increase is expected to occur at Texas public community colleges, but increases at public universities account for over one-third of the increase. This suggests that more and more high school graduates will be opting for initiating their postsecondary education at community colleges, then subsequently transferring to traditional four-year colleges and universities. In Texas, about one in five community college first-time enrollees ultimately transfers to a college or university.

**Table 4**  
Fall Headcount Enrollment Forecasts: Texas Institutions of Higher Education

Institution Type	% Change:		
	1997	2010	1997-2010
Public Universities	401,685	444,623	10.7%
Public Community Colleges	423,047	486,087	14.9%
Independent Colleges & Universities	99,022	107,305	8.4%
State Technical Colleges	8,317	8,885	6.8%
<b>Totals</b>	<b>932,071</b>	<b>1,046,900</b>	<b>12.3%</b>

Source: Texas Higher Education Coordinating Board web site (<http://www.thecb.state.tx.us/divisions/planning/eforecast/table1.htm>)

THECB estimates that approximately 125,000 to 135,000 new students enter Texas public universities, community colleges and technical colleges each fall.<sup>6</sup> On average, about 90 percent of these new students will be Texas residents, although this proportion may be declining slightly. Just 60 to 65 percent of these first-time entrants will take enough credit hours to be considered full-time students.

The amount of time it takes to earn a bachelor’s degree is of obvious importance to the economic analysis of returns to higher education. In Texas, fewer than 30 percent of those who earn a baccalaureate do so in four years or less. The mean time to degree is about six years today, at which point just under one-half of an entering cohort will have earned a degree, about 30 percent will still be enrolled, and some 20 percent will have dropped out. By ten years after first matriculating, the overall graduation rate approaches 56 percent in Texas colleges and universities.

These figures do not stack up well against the limited information that is available from other states. To date, there has been no comprehensive study of nationwide six-year graduation rates. However, the National Collegiate Athletic Association (NCAA) has looked at this issue for its member institutions and has reported these rates for 73 public universities in the ten most populous states. Texas is home to 15 of the public universities examined by the NCAA. Twelve of those universities (80 percent) ranked in the 20th percentile or worse of all NCAA member institutions, and seven were in the bottom 10 percent of six-year graduation rates.

As for the nation as a whole, mean time to degree in Texas appears to be increasing for a number of reasons. One of the principal explanations for this is that, because financial aid is inadequate, more students are required to work and attend school part-time. Little solid information is available about how part-time versus full-time status affects ultimate rates of graduation, but it is clear that increased time to degree both increases the costs and reduces the lifetime direct and indirect benefits of postsecondary education.

#### 4.4 Costs of Higher Education and Sources of Financial Aid

The most recent THECB estimates of the average direct costs to full-time students and their families of postsecondary education in Texas are presented in Table 5. These costs may well be increasing in Texas at a rate which is greater than the national average. In response to this concern, the Texas Legislature recently established the “Texas Tomorrow Fund” to allow Texas parents to prepay their children’s future tuition and required fees for state higher education institutions at today’s prices.<sup>7</sup>

6 See “Baccalaureate Graduation Rate Report,” THECB. The text of this report is available online at <http://www.thecb.state.tx.us/divisions/planning/graduate/GRADFIN.HTM>. Most of the statistics discussed in this section are derived from that report.

7 This program has proved to be exceptionally popular, attracting 65,000 contracts from concerned parents during its first two years of operation alone. Nearly 90 percent of these contracts were apparently purchased for newborns, as they pertain to the entering college freshman class of 2015. More than 40 percent of these contracts were purchased for children presently in pre-school through fifth grade.

**Table 5**  
Direct Costs of Higher Education in Texas: 1997-98

Institution Type	Tuition & Fees	Books & Supplies	Room & Board	Transportation	Personal	Total
Independent College	\$8,715	\$619	\$4,228	\$954	\$1,252	\$15,768
Public University	\$2,069	\$632	\$4,772	\$1,480	\$1,528	\$10,481
Community College	\$753	\$661	\$3,871	\$1,152	\$1,278	\$7,715
Technical College	\$1,543	\$729	\$4,511	\$1,398	\$1,068	\$9,249

Source: Drawn from data on the Texas Higher Education Coordinating Board web site at URL <http://www.theccb.state.tx.us/divisions/student/budgets.htm>

Room and board is the single largest direct expense anticipated for students at Texas public institutions, and it is also reasonable to believe that these costs will grow rapidly for current and future students. Dormitory space is already over-subscribed at most colleges and universities, and it is quite expensive to add. Most of these institutions are also located in or near large population centers where rents are rising on apartment space due to the large increase in population Texas has been experiencing.

What options are available in Texas for students and families that cannot themselves afford the entirety of these kinds of expenses? Perhaps the most efficient step is to complete the Free Application for Federal Student Aid (FAFSA). By filing out the FAFSA (which has no application fee), students are able to apply for the vast majority of aid that is available. Simplifying the process has been a major thrust of federal public policy on this issue for the last ten years, with the result that the costs (in terms of both time and money) of applying for aid have never been lower.

THECB has compiled summary statistics for many types of state and federal financial assistance programs over the past five years, though the vast majority of aid available (almost 86 percent) comes from the federal government. In real terms, THECB estimated that total assistance had increased 38 percent from FY1992 to FY1996, reaching \$2.1 billion. About 71 percent of this amount came in the form of loans and 22 percent in the form of grants and scholarships. Despite these gains, financing higher education remains a serious problem for the great majority of students. In FY1996, total aid of all types averaged about \$2,700 per enrolled student, or about one-fourth what the typical full-time student at a public university would expect to pay.

## 5.0 The Effects of “Equalization” in Texas

The means by which Texas can maintain and strengthen its position in the national and world economy has clearly evolved away from the extraction and processing of natural resources. A natural resource based economy is inherently at greater risk from both shifts in demand and entry of new players in the market than one that emphasizes higher value-added products and services. There is ample evidence of this fact in Texas. While many hope for the days of \$80/barrel oil, very few would suggest that reliance on oil is a viable means of securing the state’s economic future. Even the nature of the oil business itself has changed, as the role of technology has greatly expanded during the industry’s recent resurgence.

The logical outgrowth of the boom and bust cycle for oil and real estate has been a focus on greater diversification, with an emphasis on industries that serve “export” markets, meaning industries who sell goods and services outside the state. Essentially, these industries fall into three general categories:

- High Value-Added Production — “high-tech” production operations where knowledge (embodied in technology) is the primary component of total value created.

- High Value-Added Support — industries that are either the upstream or downstream from high-tech operations; e.g., professional services firms, software companies, etc.
- Low-Cost Production — industries that take advantage of special cost factors currently present in Texas (such as lower labor costs on the Border) to create a competitive advantage.

Undoubtedly, each category has contributed to Texas' recent economic success, but it remains unclear whether each will prosper in the long run. In particular, the potential downfall of successful low-cost production can become self-defeating. For example, as the Border production process grows, wage rates are inclined to rise, leading to a corresponding reduction in one of the factors that initially induced firms to move production to the Border. The simplified example does not forecast the demise of Border production. Rather, competitive advantage based on lower costs is not likely to be permanent, especially in light of an increasing number of alternative potential low-cost production centers.

In the higher value-added industries, the primary competitive advantage of a geographic area is a well-trained, educated labor force. Given that knowledge, especially vital in technology, is an important component of the overall value these industries create, it follows that generally they require better educated workers than other more traditional industries found in Texas. Furthermore, the innovation process in these industries demands a certain level of education. For example, if workers are to create the next generation of microchips, they first must know how existing microchips work.

Although few individuals must have advanced degrees in order to function in the modern economy, it is evident that a more complex and competitive economic environment requires a greater commitment to higher education. This is especially true in light of current demographic trends. Many long-term economic forecasts for Texas predict a relatively brighter future than that facing the nation as a whole, due to anticipated higher birth rates in Texas creating a larger supply of workers. However, this “glass is half-full” approach ignores that Texas is projected to have such a plentiful labor supply because of the relatively high proportion of minorities in the state who have higher birth rates than the present white majority. Section 4 indicates minority students are less likely to attend college than their non-minority peers, which means that many are failing to fulfill their economic potential. The “opportunity cost” implications are significant for both the individual and for society as a whole. For the individual, the direct economic cost of not attending college can represent hundreds of thousands of dollars over a lifetime,<sup>8</sup> a situation ignoring the attendant human impacts. For society as a whole, the opportunity costs represent a foregone economic opportunity. The following section quantifies this lost opportunity for both the state and its metropolitan areas.

### 5.1 Methodology

In order to estimate the impact of increasing the level of college-educated Texans on the state's economy, the following three-step methodology was used. The base year of the study was 1996, with projections made through the year 2010. The first step assumes that African-American and Hispanic students attend college in the same proportion as white students by estimating that each group attains the same ratio of college graduates to high school as the control group, the white population. In effect, this assumption shows the level of African-American college graduates in Texas increases by 9 percentage points, while the level of Hispanic college graduates increases by 7.5 percentage points.

The second step evaluates the relationship between higher education and economic activity. Data compiled by the U.S. Census Bureau were used to estimate the ratio of annual earnings of college graduates to high school graduates from 1967 to 1996. In 1996, the data indicated that college graduates earned 76 percent more per year than those who have only a high school education. A trend function was estimated from the time series data to extrapolate this earnings ratio into the forecast period. Assuming that earnings are a reasonable proxy for productivity, the effect of bringing the incidence of African-American and Hispanic higher education to a level commensurate with

<sup>8</sup> See Section 3.

whites raises the overall productivity of each group by 15.8 percent and 13.2 percent, respectively.

The final step in the process calculates the implications of the enhanced productivity previously discussed on the Texas economy. For each year, a productivity enhancement was calculated for the state and each metropolitan area by weighting the estimated productivity increases for African-Americans and Hispanics by their relative shares of the adult population within each area. All other things being equal, the productivity enhancement of step 2 would have caused the Texas economy to be 4.0 percent larger in 1996 than it actually was rising to 5.1 percent above the baseline economic forecast for the year 2010. This assessment is independent of the indirect and induced effects of this economic stimulus; when secondary effects are considered, the total impact could easily approach 10 percent. The results for each metropolitan area follow.

**Table 6**  
The Effect of Productivity Enhancement on the Texas Economy  
*Assumes All Ethnic Groups Attend College at Commensurate Rates*

	1996	2000	2005	2010
Abilene	2.7%	3.0%	3.4%	3.8%
Amarillo	2.5%	2.9%	3.4%	4.0%
Austin	3.8%	4.0%	4.4%	4.7%
Beaumont	4.1%	4.4%	4.8%	5.2%
Brownsville - Harlingen	10.8%	11.3%	12.0%	12.6%
Bryan - College Station	3.3%	3.6%	4.1%	4.4%
Corpus Christi	7.1%	7.4%	7.9%	8.3%
Dallas	4.0%	4.3%	4.6%	5.0%
El Paso	9.3%	9.9%	10.6%	11.2%
Fort Worth	3.0%	3.2%	3.5%	3.9%
Houston	5.1%	5.5%	6.0%	6.5%
Killeen-Temple	4.2%	4.5%	5.0%	5.6%
Laredo	12.3%	12.7%	13.2%	13.7%
Longview	3.8%	4.1%	4.4%	4.8%
Lubbock	3.9%	4.3%	4.7%	5.2%
McAllen - Edinburg	11.3%	11.8%	12.5%	13.1%
Midland - Odessa	4.3%	4.9%	5.7%	6.5%
San Angelo	3.9%	4.3%	4.8%	5.3%
San Antonio	6.8%	7.1%	7.6%	8.0%
Sherman	1.4%	1.6%	1.8%	2.0%
Texarkana	3.6%	3.8%	4.0%	4.3%
Tyler	3.9%	4.1%	4.4%	4.7%
Victoria	5.2%	5.6%	6.2%	6.8%
Waco	3.8%	4.1%	4.5%	5.0%
Wichita Falls	2.5%	2.8%	3.2%	3.6%
Texas	4.0%	4.3%	4.7%	5.1%

### Conclusion

The principal determinant of economic success in a modern economy is the ability to acquire, process, and apply knowledge. Educational attainment levels reflect this ability. Those who are better educated have a greater incidence of knowledge-related skills and abilities. The primary asset of any firm is its workforce. People, and the knowledge they possess, are increasingly the fundamental basis of adding value to a firm.

Current student aid programs have worked well to remove financial barriers to higher education. However, students increasingly have had to rely on loans to pay for higher education. While this study shows, on average, such an expense is an excellent investment, loans entail an element of risk that deters students — especially those from low-income families — from attending college. The results of this study clearly demonstrate, however, the tremendous return on investment that education represents.

Texas is in the fortunate position of possessing abundant “raw material” for the modern economy, as birth rates are expected to continue to outpace those for the nation as a whole. However, this potential is only realized if workers receive adequate training and skills development, which increasingly means postsecondary education. A college education, therefore, should be seen as an investment, both by the individual and by the state of Texas. The return on that investment to each is enormous.