October 11, 2010

The Honorable David Dewhurst
Lieutenant Governor
State of Texas
Capitol Building, Room 2E.13
Austin, Texas 78701

The Honorable Joseph R. Straus, III
Speaker of the House
Texas House of Representatives
Capitol Building, Room 2W.13
Austin, Texas 78701

Gentlemen:

In response to the requirements of Sec. 403.359 of House Bill 1935 (81st Legislature, Regular Session), which directed my office to study the feasibility of basing a portion of all public postsecondary technical training program funding on the economic benefit of the program to the state, I am pleased to submit this report.

In addition to determining the economic benefit of a postsecondary program, HB 1935 also directed the Comptroller to estimate the "additional tax revenue generated by employers that results from the ability of public junior colleges, public state colleges, or public technical institutes to prepare students for employment fields for which there is employer demand."

Comptroller staff, with assistance and data from the Texas Higher Education Coordinating Board and the Texas Workforce Commission, has estimated the additional tax revenue generated by public community, junior and technical college graduates.

According to our assessment, the total additional discounted lifetime wages and salaries of all technical program completers in our study's sample is estimated to be *$31.1 billion*. The total additional discounted lifetime tax revenue generated by Texas' public two-year graduates of technical associate and certificate programs is estimated in the aggregate at *$2.4 billion*, and per completer is estimated at *$10,728*.

In evaluating the feasibility of basing higher education funding on economic returns, our staff encountered several data challenges that limited our analysis.

The data available to Comptroller analysts was inconsistent regarding the number of graduates across programs, and there were an insufficient number of observations to produce reliable estimates. Some educational programs have relatively few graduates, and their economic return to the state might be over- or understated because program completers' wages are presented as an average.

Because of confidentiality considerations related to FERPA (the Family Educational Rights and Privacy Act of 1974), Comptroller staff did not have access to individualized data on wages and other demographic factors that would have allowed a more thorough analysis. The Coordinating Board, however, has access to individual student records with accompanying demographic data.

The Texas Workforce Commission provides the Coordinating Board with wage data from the Unemployment Insurance (UI) employee wage database, which could be used to independently verify information from the two-year institutions. Comptroller staff, however, did not have complete access to the UI database, which was the source of wage data used in our analysis.

Even with full access to the data, however, the analysis would face some challenges. For example, the UI wage data do not contain detail on the number of hours worked nor do they differentiate between full- and part-time employees, so it is not possible for our analysts to determine a quarterly or annual salary for individuals in the database.

The UI database also lacks the detail needed for us to determine if a particular higher educational program was instrumental in obtaining high-wage employment. The database includes employer name, primary location and industry, but it does not include the occupation or job title the individual currently holds with that employer, nor does it include the number of hours worked or even if the job is part-time or full-time. And, if the employer has more than one location, it might not accurately depict where the employee actually works.

Occupational titles and the various attributes of each occupation are standardized, coded and used for other Bureau of Labor Statistics and Employment and Training Administration programs. These Standard Occupational Classification (SOC) codes, however, are not present in the UI database, so it is not possible to determine whether or not a completer is working in a field related to their two-year degree or certificate.

Given the data available, it would be extremely difficult to attribute an economic benefit entirely to any particular program or institution. The data do not indicate what competencies are conveyed by a specific program area, nor can we determine if an increase in wages is due to training, experience or some combination of the two.

Even so, access to individual records would allow any future analyses to be made with more reliable results. The addition of demographic data would allow for a more complete analysis and comparisons among groups with similar characteristics. Researchers with unrestricted access to educational and wage and employment data would be in the best position to perform this analysis.

As the bill directed the Comptroller to provide you with recommendations for legislative action, I respectfully submit the following proposals:

- **Should the Legislature decide to adopt a funding model based on the economic returns to the state of a particular technical program, the Comptroller's role should be to provide the methodology and the appropriate discount, attrition and tax rates to the Texas Higher Education Coordinating Board.** As demonstrated in our analysis, our office can provide support to the Coordinating Board in developing models to estimate economic impact and additional tax revenue.

- **Should the Legislature choose to adopt this funding model, it could consider asking the affected institutions to provide more specific data to the Texas Higher Education Coordinating Board for the purpose of determining funding allocations based on the economic returns of technical programs.** Current weaknesses with existing data could be resolved by asking some or all of Texas' public two-year institutions to survey their program graduates for job and wage data and report it to the Coordinating Board to be used in determining funding allocations.

Enclosed, we have included a technical appendix detailing our methodology and additional information regarding the data we used in our analysis. Please let me know if we can provide any additional information to you.

Sincerely,

Susan Combs

Enclosure

Technical Appendix

Methodology

In considering the economic returns to the state from technical program graduates, the Texas Higher Education Coordinating Board matched its student records with Unemployment Insurance (UI) quarterly wage records from the Texas Workforce Commission. The Comptroller then examined the educational and wage data the Coordinating Board provided.

To comply with the Family Educational Rights and Privacy Act of 1974, the Coordinating Board provided the Comptroller with aggregate rather than individual data. The Coordinating Board aggregated the data by four-digit Classification of Instructional Program (CIP) code, providing mean annual wages for each code, along with the highest degree earned, average age of students in the program and the number of program completers/graduates.

The U.S. Department of Education's National Center for Education Statistics (NCES) developed CIP codes in 1980. These six-digit codes provide a taxonomy of educational programs that supports "accurate tracking, assessment and reporting of fields of study and program completions."[1]

CIP codes provide a standard classification system for postsecondary educational programs that colleges and universities can use to identify certificate and degree programs, courses and major fields of study.

The data used for this analysis were sorted by CIP code for 10 years, including the year of program completion and the subsequent nine years. Annual average wages and an average age for students in the program were used to make comparisons to a baseline, here representing high school graduates of the same age. The aggregated student data had no average wages for some CIPs for some years. In these cases, wages were estimated using the same method employed to estimate lifetime wages and salaires (described later).

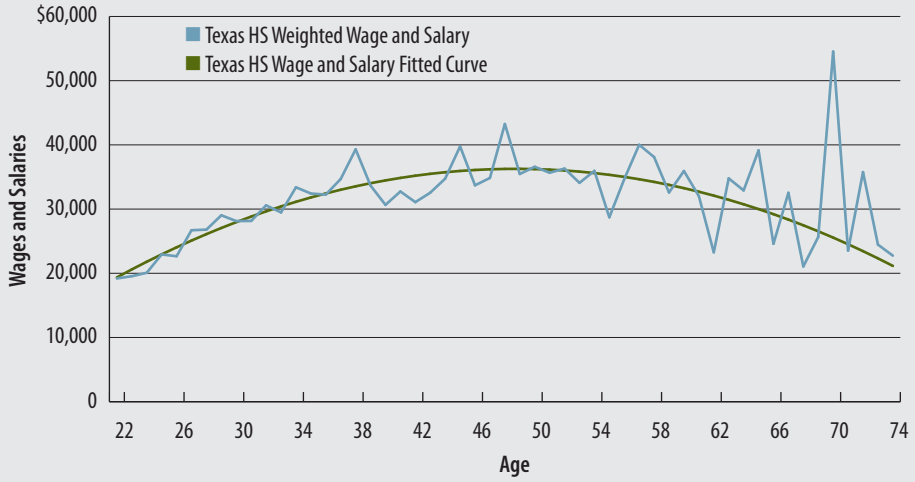
CIP codes go up to a six-digit level of specificity, but at this level of detail, the number of observations in each group could be insufficient for statistical analysis. CIP codes are also available at the broader, two-digit level. However, an analysis at the two-digit level would not allow for examination of each specific program. For example, marketing, accounting and real estate programs, or health aides and radiology technologists would all be grouped together at the two-digit level. The data for this study were analyzed at the four-digit CIP code level.

To estimate average lifetime wages and salaries based on the first ten years of data, the Comptroller estimated wages over the rest of completers' work-lives. Census Current Population Survey (CPS) data were used to estimate average wages and salaries for Texas high school graduates and holders of technical associate degrees and certificates of all ages. These data then were used to find the relationship between average age and average wages in the CPS data.

The Comptroller assumed that community college and Texas State Technical College completers' wages follow the same wage path. The age and weighted-average wage and salary trend lines were used as scaling factors but each CIP has a different path; engineering technicians' average wages are higher than those of cosmetologists, for example. The scaling factors shift the generic associate degree or certificate completer wage paths up or down to correspond with CIP-specific reported wages.

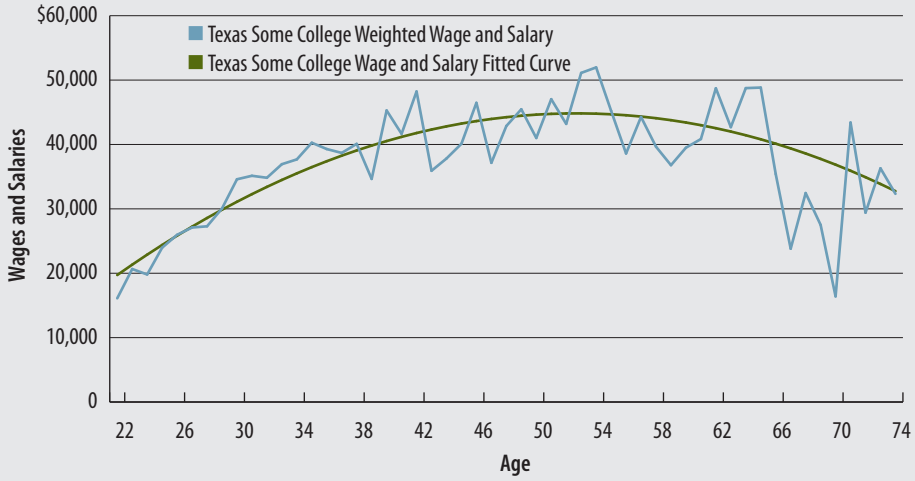
The following charts show lifetime earnings for various levels of educational attainment. The weighted wage and salary line (blue) comes from CPS data and the fitted curve (green) smoothes out the fluctuations to provide a line of best fit. This fitted curve is then used to estimate lifetime salaries and wages for 10 to 50 years after graduation for Texans with a high school diploma, Texans with some college and Texans with technical associate degrees.

Individual Lifetime Wages and Salaries for Texans with a High School Diploma



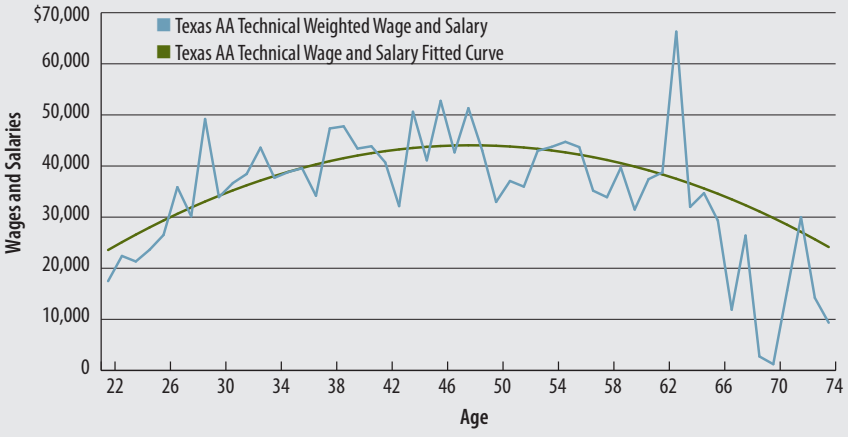
Source: U.S. Bureau of the Census and Texas Comptroller of Public Accounts.

Individual Lifetime Wages and Salaries for Texans with Some College



Source: U.S. Bureau of the Census and Texas Comptroller of Public Accounts.

Individual Lifetime Wages and Salaries for Texans with a Technical Associate Degree



Source: U.S. Bureau of the Census and Texas Comptroller of Public Accounts.

Because this study examines the lifetime wages and salaries of program graduates, a "discount rate" of 4 percent was used to account for future inflation, allowing for the analysis of future wages and salaries in current dollars. A discount rate helps analysts make investment decisions by adjusting a series of future cash flows into today's value. It also accounts for potential interest that could otherwise be earned from a safe investment.

For the purposes of this study, the average person is assumed to work until the age of 74. The formula for determining how long a program graduate will work, then, is 74 years minus the program participant's average age at graduation.

Some program graduates will fall out of the UI database – they will leave the state, change occupations, retire or stop working for other reasons. Over time, then, the proportion of a given graduating class that is currently in the study's sample will decrease.

The estimated share of 30- to 74-year-olds that move out of state in a given year was assumed to be 1.49 percent (based on 2009 Census estimates).[2] The chance of an occupational injury that causes at least one year of lost employment was assumed to be 0.63 percent (based on data from the Bureau of Labor Statistics and the Texas Department of Insurance).[3] The chance that a 35- to 44-year-old will die in a given year was assumed to be 0.19 percent, 0.44 percent for a 45 to 54-year-old, 0.92 percent for a 55 to 64-year-old, and 2.11 percent for a 65 to 74-year-old (based on statistics from the U.S. Centers for Disease

Control and Prevention).[4] The 3 percent average annual attrition rate used in this analysis is the combined impact of these and other factors.

To estimate the additional lifetime wages and salaries of program graduates, the discounted lifetime additional wages and salaries per program completer were multiplied by the number of program completers/graduates. The additional lifetime wages and salaries then were multiplied by the effective tax rate to calculate discounted lifetime additional tax revenue.

The effective tax rate used for this analysis was 7.7 percent. This was calculated as the ratio of annual state tax collections ($38 billion) to total wage and salary income in Texas ($492 billion) in 2009.

Results

As shown below, the Comptroller estimated the total additional discounted income of all technical program completers in our study's sample at $31.1 billion. The total additional discounted tax revenue generated by Texas' public two-year graduates of technical associate and certificate programs is estimated at $2.4 billion. The lifetime additional discounted tax revenue per completer is estimated at $10,728.

Additional Discounted Lifetime Income and Tax Revenue Technical Degree and Certificate Completers

Additional Discounted Lifetime Income and Tax Revenue	All Completers (222,928)	Per Completer
Lifetime Income	$31,059,437,557	$139,325
Tax Revenue	$2,391,576,692	$10,728

Source: Texas Comptroller of Public Accounts.

The following table shows additional discounted lifetime income and tax revenue per completer for both associate in applied science (AAS) degrees and technical program certificates.

Additional Discounted Lifetime Income and Tax Revenue per Completer by Degree Type

Additional Discounted Lifetime Income and Tax Revenue per Completer	Assoc. in Applied Science	Certificate
Lifetime Income	$197,621	$90,083
Tax Revenue	$15,217	$6,936

Source: Texas Comptroller of Public Accounts.

Endnotes

1. U.S. Department of Education, National Center for Education Statistics, "Classification of Instructional Programs (CIP 2000)," http://nces.ed.gov/pubs2002/cip2000/. (Last visited July 23, 2010.)
2. U.S. Census Bureau, "Geographical Mobility/Migration," http://www.census.gov/population/www/socdemo/migrate.html. (Last visited July 23, 2010.)
3. U.S. Bureau of Labor Statistics, "Economic New Release: Table 7. Incidence Rates of Nonfatal Occupational Injuries and Illnesses by Major Private Industry Sector and Selected Case Types, 2006-2008," http://www.bls.gov/news.release/osh.t07.htm; and Texas Department of Insurance, *Biennial Report of the Texas Department of Insurance To the 80th Legislature, Division of Workers' Compensation* (Austin, Texas, December 2006), pp 2-3, http://www.tdi.state.tx.us/reports/dwc/documents/wc2006.pdf. (Last visited July 23, 2010.)
4. U.S. Centers for Disease Control and Prevention, "National Vital Statistics System: Mortality Tables, Death Rates by 10-Year Age Groups: United States and Each State, 1999-2006," http://www.cdc.gov/nchs/nvss/mortality_tables.htm. (Last visited July 23, 2010.)