

## **Projections Methodology**

The industry and occupation employment projections presented were funded by the Department of Labor's Employment and Training Administration. Projections are generated every two years for a ten-year period. The process of making employment projections depends on two main ingredients: industry employment and occupation employment with each industry (staffing patterns). The projection process is as follows:

- A. Development of industry historical employment trends (time series)
- B. Development of industry employment projections
- C. Development of occupation employment within each industry (staffing patterns)
- D. Development of occupational employment projections

### **Development of industry historical employment trends (time series)**

Time series of annual average employment were developed at the 3-digit Standard Industrial Classification (SIC) level for Texas and the 28 Workforce Development Areas (WDAs). There are two principal sources for the industry employment time series (1) the quarterly ES-202 Covered Employment and Wages Report and (2) the current employment Statistics (CES) Survey. The highly detailed county data from the ES-202 are aggregated to represent the county definition for each WDA. The time series is the foundation for developing industry employment projections using the Long-Term Industry Projection System, a PC-based system.

### **Development of industry employment projections**

Using the Long-Term Industry Projection System, statewide and labor area historical trends and U. S. relationships were used in conjunction with the forecast of Texas unemployment rates, gross state product (GSP), population, personal income, per capita incomes, and labor force. The projections were developed through various types of regression and shift-share analyzes. The initial projections were reviewed and adjusted using knowledge of the industrial and local conditions not considered in the historical data. U.S. historical and projected data used were those generated and published by the Department of Labor's Bureau of Labor Statistics. Projected Texas unemployment rates and gross state product were provided through the State Comptroller's Office. Population, personal income data, and labor force came from the Bureau of Economic Analysis, U.S. Department of Commerce.

### **Development of occupational employment within each industry (staffing pattern)**

The Texas Occupational Employment Statistics (OES) Survey provides current estimates of occupational employment by industry. A sample of establishments in the non-farm wage and salary sectors of the economy is surveyed annually to obtain employment levels for over 800 occupations. The survey, the basis for these projections, was a cooperative effort between the Labor Market Information Department of the Texas Workforce Commission and the Bureau of Labor Statistics (BLS), U.S. Department of Labor. The survey sampled 26,000 Texas employers per year. Data from years 1998, 1999, and 2000 were used to fully collect the same of approximately 78,000 businesses. Data from employing establishments are primarily collected by mail, with telephone follow-ups.

Employment for industries not covered by the OES survey was developed by using national patterns. These staffing patterns are for Agriculture Production, Crops and Livestock, Forestry, Fishing, and Private Households. Federal Government staffing patterns were provided by the BLS.

### **Development of occupation employment projections**

Each industry has a unique occupational structure. The growth and decline of individual industries impact the growth and decline of occupations needed to staff these industries. Statewide and WDA employment estimates were developed for 2000 and projected to the year 2010.

The PC-based MicroMatrix System is used to develop occupation employment projections requiring the following data items:

- Industry employment projection for a base and projected year by 3-digit SIC
- Occupational Staffing Patterns by 3-digit SIC
- National Technology Change Factors
- National Ratios of Self-Employed to Wage & Salary Workers
- National Replacement Rates

Using the MicroMatrix System, an industry/occupation (I/O) matrix of nearly 400 industries using the Standard Industrial Classification (SIC) system and over 800 occupations using the Standard Occupation Classification (SOC) system were developed. The I/O matrix represents the occupational staffing patterns of each 3-digit industry by SIC. The I/O matrix reflects each industry's typical or average staffing pattern in terms of the ratio or percentage of occupational employment to total industry employment. The I/O matrix tabulates employment cross classified by industry and occupation reflecting either employment distribution by occupation or by industry. The matrix shows the industries where people work and the jobs they hold.

The MicroMatrix System used the results of the OES Survey to translate projections of industry employment into occupational employment projections. A base year, 2000, I/O matrix was produced using 2000 industrial employment for each 3-digit SIC. A projected, 2010, I/O matrix was produced using the 2010 industrial projections and the national change factors.

BLS developed national change factors through studies of current industry staffing patterns and emerging trends. These factors estimate changes in industry staffing patterns brought about by new technology and changing business practices. Change factors are applied to calculate the change of an occupation within an industry. The change factors are national estimates. A bias may result to the extent that Texas trends may be different from national trends.

BLS provides national base and projected year ratios for self-employed persons and unpaid family workers. These ratios are applied to each occupation's base and projected year wage and salary total employment to acquire self-employed figures. The self-employed figures are added to the appropriate wage and salary occupation total to obtain occupational employment totals that include self-employed.

Annual job openings are divided into two categories: job openings due to growth and job openings due to net replacement needs. Job openings due to growth are created by industry employment expansion. Job openings due to net replacement estimate the need in existing jobs

as workers vacate, change jobs, or leave the labor force. Annual average jobs openings due to growth are simply calculated by dividing the projected employment growth by ten, the projection period. Annual average job openings due to net replacement are calculated by using national new replacement rates. The replacement rates provided by the BLS are for two five-year periods. For the ten-year period projections, the rates are summed and multiplied by the occupation's base year employment. The result is divided by ten for an annual replacement. Growth demand is rarely the main cause of net openings. Growth demand creates the majority of openings only in the fastest growing occupations. Negative growth is shown as "zero", so a negative growth demand will not affect the replacement need.

### **ASSUMPTIONS & LIMITATIONS**

The projections reflect studies of past and present industrial trends. It illustrates what is likely to happen, barring major changes from past trends. These projections are based on the same major economic assumptions the BLS uses to develop national projections. These assumptions are:

- Work patterns will not change significantly over the projection period; for example, the average workweek will not change markedly;
- broad social and educational trends will continue;
- there will be no major war;
- there will not be a significant change in the size of the Armed Forces; and
- fluctuations in economic activity due to the business cycle will continue to occur.

It is unlikely that these projections will precisely predict actual employment developments, because the Texas economy is sensitive to unforeseen national and international trends and policies. However, the basic trends should prove accurate and aid in successful decision-making.

The OES program surveys Texas employers, so these estimates are based on the number of jobs in Texas, including multi-job holders in Texas and those who live out of the state but work in Texas. Sampling and non-sampling errors may affect the accuracy of the OES Survey data. Non-sampling errors generally result from employer responses and inadequate survey coverage. Sampling errors, which may cause variations in estimates, are often the result of variations in sampling techniques.

Readers should view the employment estimates as indicators of relative magnitude and probably direction rather than as estimates of absolute values. Therefore, consider these projections a starting point when studying future industry and occupational employment.

### **Wages**

Wages that are included in this publication are the results of the 2000 Occupational Employment Statistics (OES) Survey. The survey sampled over 26,000 establishments annually, taking three years to fully collect a sample of approximately 78,000 firms. For additional information regarding wage data, please contact the Labor Market Information Department.