Evaluating the 1995 BLS projections

Projections of the labor force and industry and occupational projections to 1995 were relatively accurate; differences that did occur are identified and analyzed to inform users and to improve future projections

Introduction

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The Bureau of Labor Statistics prepares projections of the labor force, industry employment, and occupational employment every other year. Because of the uncertainty inherent in making these projections, the Bureau evaluates the results of past projections each time a target year is reached, to gauge how well the projections tracked against actual change. The evaluations provide users of BLS projections with information to enhance their understanding of the problems faced in developing accurate projections and to assess the manner of using projections in the future. Among the many users of projections are those in the fields of career guidance, education planning, and public policy formulation. In these fields, numerous decisions are made based on differences in projected labor force growth rates by race, age, sex, and Hispanic origin and on comparisons of growth rates among industries and occupations. State employment security agencies incorporate data from BLS projections into the models they use to develop industry and occupational projections for their State. Business officials in the private sector utilize the projections in personnel planning and marketing research. Academic researchers employ the projections as background information to study a wide variety of topics dealing with the labor market. Knowledge of the accuracy of BLS projections affects whether an individual or agency will rely on the projections in the future and, if so, how the projections will subsequently be used.

The Bureau also considers evaluation to be an important stage of its projections program. Through evaluation, the Bureau can identify strengths and weaknesses in procedures used to prepare the projections. Such identification leads to changes in those procedures for use in the development of later projections.

Many causes of inaccuracies in the projections are identified in studies comparing actual with projected change in the labor force, industry employment, and occupational employment. Some of the broad assumptions made in the models used to develop the projections, such as levels of defense expenditures, are very sensitive to political forces and, therefore, subject to great uncertainty over a 10-year period. Other broad assumptions, such as the strength of the world economy, also are subject to considerable variability and are very important to levels of exports and imports that have a great impact on employment. In addition, a multitude of judgments stemming from the analyses conducted by BLS staff in determining specific effects of technological change are subject to significant error. For example, in assessing the impact of word-processing equipment on the employment of typists, it seemed clear in 1984 that technology would have a negative effect. That assessment turned out to be correct, but the projected decreases in the utilization of typists made by BLS analysts in gauging future staffing patterns of industries fell short of actual decreases.

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Evaluation measures

The general procedure the Office of Employment Projections uses to evaluate projections is to compare projected with actual data. Such comparisons can be presented in a variety of statistical measures, such as percent change or numerical growth. One of the problems with these measures is that it is difficult to determine the quality of the projections, because there are no established criteria to categorize them as good or bad. For example, if actual data show that employment in an occupation increased by 20 percent, and the Bureau projected a growth rate of, say, 10 percent (or 30 percent or 40 percent, for that matter), it is not clear whether the projected rate is good or bad. Consequently, users must establish their own standards of quality, based on the uses they make of the projections. In general, if their decisions would not differ if the projections were perfect, then the error is not significant. For instance, referring back to the foregoing numbers, if a user would have made the same decisions if the projected level were perfect (20 percent) as he or she in fact made with the 30-percent projection of growth, then the 30-percent projection may not be accurate, but it can be assumed to be accurate enough for that user's needs.

Because standards are not available, several measures that compare projected and actual employment are presented in the evaluations of labor force, industry employment, and occupational employment projections that follow. These include a simple comparison of the direction of change to see whether employment in the occupations that were projected to grow or decline actually did change in the direction projected. Numerical change also is presented, but the use of this measure to determine general accuracy can distort an evaluation, because the quality of projections having the same numerical error are different for occupations having different employment levels in the base year of the projection. For this reason, the measure given the most attention in the evaluations is the absolute percent error—the numerical error (positive or negative) divided by actual employment in the target year of the projection. Another measure used to evaluate the projections is a comparison of the distribution of the projected change with the distribution of the actual change. This measure is important for identifying whether any particular projection errors are related to judgment errors tied to a specific industry or occupation or to general projections of total employment.

The projection period used by the Bureau typically has ranged from 10 to 15 years, with the target year always ending in a zero or a five. The year 1995 was the target year of two sets of projections, 1982–95 and 1984–95. Only the 1984–95 projections are evaluated in this article, because the classification of occupations that was used for the 1982–95 projections was based on a system significantly different from the one used to tabulate current 1995 data. The Bureau's 1984–95 projections included three alternative scenarios, labeled high, moderate, and low growth. Only the moderate-growth projections are evaluated here, as they were the chief ones used by the Bureau, the alternatives having been used only sparingly, not just by the Bureau, but by others as well. In the 1996–2006 projections currently being developed (to be published in the November 1997 issue of the *Review*), only a moderate-growth scenario is being prepared.

The reader should note that differences in projected change and actual change are subject to measurement error because of both normal response errors and statistical errors associated with the surveys used to measure current employment in the base year, as well as the target year, of the projections. Some of these errors stem from changes in the surveys used to compile the data over time. For example, a modification was made to the Current Population Survey (CPS) in 1994 that significantly changed the reporting of labor force participation for older workers. This in turn had a measurable, significant impact on the quality of labor force participation rate projections for these workers. Accordingly, some projection errors identified in the evaluations may well reflect the effect of data collection changes in the CPS.

The labor force, industry employment, and occupational employment projections are highly interrelated, as the models used to develop each of these segments are dependent on each other. For example, the labor force projections have a great bearing on total employment projections, and industry employment projections influence occupational projections, because occupations tend to be concentrated by industry. The closeness of these relationships is shown clearly in the evaluations.

In general, the evaluations demonstrate that the BLS projections captured major trends in the labor force, in industry employment, and in occupational employment. The discussions that follow, however, each written by a different author, tend to focus on the *inaccuracies* of the projections. Odd though this may seem, it enables users to get a better understanding of the factors that are most likely to lead to projection errors. □