

# New Approach to Measuring Occupational Wages

BY KENNETH HOFFMANN

The Bureau recently initiated major changes in the way in which it collects and disseminates occupational wage information. Instead of surveying a pre-selected list of fewer than 50 commonly found occupations, occupations now will be randomly selected from each sampled establishment's workforce. The new survey, tentatively entitled COMP2000, provides an opportunity for virtually thousands of occupations in the nonagricultural economy to be selected. Selected occupations, in turn, will be assigned to any of approximately 450 occupations representative of 9 major occupational groups.

Occupations will be further classified into work levels using generic descriptions of factors such as the knowledge required by the job and the job's level of complexity. In the past, occupations were leveled using descriptions unique to each occupation.

## Background

Information on wages was first collected by the Federal Government in the 1850 Census,<sup>1</sup> and on occupational wages in the 1880 Census.<sup>2</sup> BLS's first study of occupational wages, conducted in 1885, measured the wages in 582 establishments in 40 industries.<sup>3</sup> The Federal Government, however, did not begin development of job descriptions for occupational wage

surveys until World War II, when the Bureau began collecting occupational wage data for the War Labor Board's wage stabilization program. Following the war, this work evolved into the Industry Wage Survey (IWS) program, which studied the wages of workers in individual industries and provided information on the occupations found in them.

The 1950s gave birth to the Area Wage Survey (AWS) program, which provided information for cross-industry occupations such as secretary and janitor for specific localities. The National Survey of Professional, Administrative, Technical and Clerical Pay (PATC) was instituted in 1960 to be used in setting salaries of Federal General

This article and the following one, entitled "COMP2000: Designing a New Wage Survey" by Beth Crimmel, focus on the Bureau's recent changes in the collection of compensation data. As detailed in the articles, the new program combines three existing programs—the Occupational Compensation Survey, Employment Cost Index, and Employee Benefits Survey. By consolidating the programs, BLS hopes to not only streamline data collection, but also provide a wider range of statistical outputs and reduce respondent burden.

Additional information on COMP2000 is available in *COMP2000-Pilot Survey, Albuquerque, NM, February-March 1996*, Bulletin 3082-1. Information and analysis will also be published in future issues of *CWC* as it becomes available.

— Editor's Note —

Kenneth Hoffmann is an economist in the Division of Compensation Data Analysis and Planning, Bureau of Labor Statistics. Telephone (202) 606-6201.

Schedule (white-collar) workers. It included almost all of the white-collar jobs in the AWS program, in addition to numerous other professional and administrative ones. The AWS and PATC programs were later combined into the Occupational Compensation Survey (OCS) program. The IWS program, which had grown to about 50 manufacturing and 20 nonmanufacturing industries surveyed on a 5-year cycle in the 1960s, was drastically reduced due to budgetary constraints in the late 1980s and early 1990s. The AWS and PATC were combined to provide local pay data suitable to set salaries of General Schedule employees on a locality basis as required by the Federal Employees Pay Comparability Act of 1990.

### Redesign of surveys

In 1987, at the request of the House and Senate Appropriations Committees, the Bureau began planning the consolidation of the Employment Cost Index (ECI), the Employee Benefits Survey (EBS), and the OCS program to produce information on total compensation for white-collar workers. The plans expanded, but did not drastically change, the products published in the past. However, in the 1990s because of decreasing resources, the Bureau decided on an even more comprehensive consolidation of programs which would yield products markedly different from those published in the past.<sup>4</sup> This consolidation of programs, known as COMP2000, must reconcile three major differences among programs: Occupational coverage, occupational definitions, and levels within occupations.

This article describes how differences will be reconciled for the wage portion of compensation; a later article will discuss plans for the reconciliation of the employee benefits portion.

*Occupational coverage.* The ECI gathers data on the vast majority of

civilian nonagricultural workers and classifies them into about 450 occupations using a Census system based on the Standard Occupational Classification System.<sup>5</sup> In contrast, the OCS studies 45 selected occupations making up about 7 percent of total civilian nonagricultural employment. Under COMP2000, earnings and benefits data will be collected for randomly selected occupations in over 35,000 establishments nationwide. Therefore, the data can be combined and weighted to represent individual occupations, major occupational groups, and all workers within the scope of the study. BLS will publish data for major occupational groups, such as precision production, craft, and repair, and, where possible, subsets of the major groups, such as construction trades occupations. In some cases the Bureau will be able to publish data on individual occupations such as carpenter.

*Occupational descriptions.* The occupational definitions used in the ECI are short and may include workers in many establishments, while the OCS definitions, typically, are more detailed and have specific inclusions and exclusions.

Occupational definitions in the ECI were designed to be inclusive of all occupations in the economy. For this reason, the ECI system has several residual categories for workers who do not fit into any of the specific occupations. For example, order clerks are part of a family of related occupations called records processing clerks, except financial. This family of occupations contains five occupations in addition to order clerks, as well as the residual category, records clerks, not elsewhere classified. In contrast to the limited set of occupations included in the OCS, the ECI allows a more complete and systematic classification of the Nation's workforce.

Because of the large number of occupations that will be studied and

the new program's emphasis on including all workers, the shorter, more inclusive ECI descriptions will be used. Thus, where data are sufficient, BLS will be able to publish data for the individual occupation, order clerk; the aggregate group, records processing clerks, except financial; the major group, administrative support occupations, including clerical; and for the even broader group, white-collar workers.

*Levels within occupations.* The method of determining the level of skills and responsibility of a job also will change drastically. The ECI does not distinguish among levels for occupations; the OCS does. The OCS classifies occupations into individual work levels based on descriptions of work duties, responsibilities, and skills that are specific to the occupation. For example, order clerks are classified into one of two levels depending on the judgment required to perform the duties; buyer/contracting specialists are placed in four levels according to the type of purchases they make; and general maintenance workers are given one of three levels depending on the types of repairs they make. In order to place a job within the appropriate level, it is necessary to be completely familiar with the unique criteria for each occupation.

Although "leveling" with specific criteria for each occupation would be almost impossible to apply to the full range of occupations in the economy, occupational information by level, nevertheless, is important to a variety of users. These include the President's Pay Agent in setting salaries for Federal General Schedule workers, and salary administrators who not only need to know what engineers average but also need to have pay rates for engineers with differing levels of experience, expertise, and responsibility. For example, under the OCS program, BLS collected and provided to the President's Pay Agent earnings

information for five distinct levels of secretaries differentiated by the secretary's responsibility and the level of the supervisor.

To provide information by level for occupations while keeping the data collection process manageable, the Bureau began testing a process called "generic leveling," which uses the same process and definitions for levels in all occupations studied. Generic leveling is an adaptation of the Factor Evaluation System,<sup>6</sup> a point factor system devised by the Office of Personnel Management (OPM) in 1977 as a master evaluation system to ensure equity among occupations when assigning General Schedule grade levels for white-collar occupations. The OPM point factor system is based on 9 elements:

- Knowledge—nine levels relating to the nature and extent of information or facts which the worker must understand to do acceptable work;
- Supervision received—five levels relating to the nature and extend of direct or indirect controls exercised by the employee's supervisor;
- Guidelines—five levels relating to the nature of instructions and the judgment needed to apply them;
- Complexity—six levels relating to the nature, variety, and intricacy of the work performed;
- Scope and effect—six levels relating to the nature of the work and its effect within and outside the organization;
- Personal contacts—four levels relating to the difficulty and setting of contacts;
- Purpose of contacts—four levels relating to the difficulty

of working with contacts and the significance of those contacts;

- Physical demands—three levels relating to the job's physical requirements; and
- Work environment—three levels relating to the job's risks and discomforts.

A tenth element, supervisory duties, which distinguishes between five levels of supervision, was added to measure the extent of workers' supervisory responsibilities. The Office of Personnel Management has a separate classification system for supervisors and managers.<sup>7</sup>

To determine the overall level for an establishment's occupations, the level and corresponding point value are determined for each factor. The points are summed for all factors. Each overall level is defined by a minimum and maximum number of points. Test descriptions for the factors, levels, the number of points for each level, and the point ranges for overall levels, are available on request.

Like other point factor systems, such as the widely used Hay Guide Chart-Profile Method, this system focuses on the requirements of the job rather than on the performance of individual workers. Systems differ, however, in factors studied, complexity, and specificity to a particular occupational group or industry.<sup>8</sup>

#### Product research

Over the past months, BLS has researched how companies compensate workers for performing supervisory functions. In a test study of supervisory practices, BLS obtained information from almost 170 establishments on their pay practices. Almost three-fourths of them determined the pay of supervisors on an individual basis or had no established relationship between the pay of supervisors and those super-

vised. Further research is now being conducted on the effect of supervisory duties on pay.

Until research leads to a structure more relevant to current salary administration practices, BLS will use the nine leveling factors developed by OPM with the number of points presently used under the Federal system. The supervisory factor will be leveled, but points will not be applied until research produces an appropriate answer.

*Area tests.* The Bureau's field staff has tested the random selection of occupations, classification of workers, and determination of work levels in six areas: Albuquerque, NM; Allentown—Bethlehem—Easton, PA; New Orleans, LA; Raleigh—Durham—Chapel Hill, NC; Rochester, NY; and Salt Lake City—Ogden, UT. Table 1 provides examples of survey results for Albuquerque. Results of each of the other five test surveys will be published in the future by the Bureau.<sup>9</sup>

Because the occupational base of about 450 occupations and industrial base of all industries, excluding agriculture, private households, and the Federal Government, is so broad, the framework exists for a very wide variety of data analyses. The limiting factor will be the number of observations found, which will vary by occupation, industry, and geographic location. The framework also permits the aggregation of data to provide estimates for groups of occupations or industries.

The geographic areas to be surveyed are statistically selected so it will be possible to publish data for at least 13 metropolitan statistical areas, all 18 consolidated metropolitan statistical areas, the 9 economic regions (as defined by the Bureau of the Census), and the United States. Data may also be published for other metropolitan statistical areas and some nonmetropolitan counties.<sup>10</sup>

*Interarea comparisons.* Currently,

**Table 1. Average hourly earnings in Albuquerque, NM, February-March 1996**

All workers .....	\$12.84
Professional specialty and technical occupations .....	20.63
Industrial engineers .....	25.71
Registered nurses .....	18.24
Sales occupations .....	12.12
Cashiers .....	6.71
Transportation and material moving occupations .....	12.41
Truckdrivers .....	13.60
Technical occupations .....	15.33
Level 5 .....	12.57
Level 6 .....	14.05
Level 7 .....	15.18
Secretaries <sup>1</sup> .....	10.03
Level 3 .....	8.06
Level 4 .....	9.92
Level 5 .....	11.24

<sup>1</sup> Estimates of earnings by level were not published for individual occupations in the

survey bulletin for Albuquerque. Such information will be published in future bulletins.

the Bureau is developing indexes that would allow comparisons of geographic areas. Comparisons of average wages and benefits among areas would be useful to workers and firm managers deciding where to locate, those interested in local area development, and those responsible for setting up area pay differentials, among others. Such users might also be interested in similar estimates that abstract from interarea differences in jobs. For example, Detroit might be a much higher wage area than Atlanta in part because of the industries that locate in Detroit, or because Atlanta area jobs are somewhat more likely to be part time.

Of course, there are not always enough data to publish reliable comparisons of every narrowly defined job, e.g., part-time secretaries in the communications industry. Furthermore, many users are not interested in that level of detail. They may prefer an average difference for a combination of jobs. Users also may not have enough information to know how jobs should be weighted when constructing an average. Yet such averages would be helpful to those who wish to abstract from interarea differences in job characteristics. The averages would, for example, tell users how much jobs in Detroit pay relative to similar jobs elsewhere.

Although the research is de-

signed, in part, to make improvements in the technical aspects of constructing these comparisons—finding proper weights for constructing averages, discovering useful job categorizations, and so forth—the goal is to provide the user with accurate and useful information on local area differences in wages and benefits.

#### *Benefits and total compensation.*

When the consolidation of COMP2000 with the Employment Cost Index and Employee Benefit survey is complete, it will be possible to relate wages to employee benefits and total compensation. For example, BLS will be able to determine whether high wages are offset by relatively lower benefits or whether workers receiving high wages are more likely to also receive above average benefits.<sup>11</sup> Likewise, BLS will be able to determine how not only wages, but also benefits and total compensation differ among occupational groups.

When completed, the data base from this program will be so large that it will be impractical to publish all information that meets the Bureau's criteria for reliability. Additional publishable information will be available in its entirety through the Bureau's Web site.

*Calibration.* As mentioned earlier, results of surveys conducted by the

OCS program have been used to set the pay of Federal workers under the Federal Employees Pay Comparability Act of 1990. In order for the information to be useful, the generic leveling results must be translated into the equivalent of Federal General Schedule grade levels similar to those obtained from the OCS.<sup>12</sup> To do so, BLS is comparing the results of over 1,500 leveling decisions made under the OCS method and through generic leveling.

A mathematical formula similar to the one underlying the 1977 Federal Factor Evaluation System will be used to translate generic factor point levels into Federal grade equivalents. The parameters from the formula will be statistically adjusted to maximize the similarity between the Federal grade equivalent from the new generically leveled data and the Federal grade equivalent assigned in the OCS program.

*Regression.* Regression techniques will also be used to see how the 10 leveling elements (knowledge, complexity, etc.) explain wage variability in the non-Federal sectors. By comparing the results of the calibration analysis with the results of the regression analysis, the Bureau hopes to gain insight into whether the Federal Government puts the same importance on elements such as complexity as does the non-Federal sector.

Information on other characteristics, such as full-time/part-time, time/incentive, and union/nonunion status, are also being collected to determine how these characteristics affect wages. The relationship between these characteristics and the 10 leveling elements also can be studied.

*Wage estimation.* BLS also hopes to develop a user-friendly wage calculator that provides users with specific information for particular occupations, levels, industries, and

geographic areas, in addition to the generic factor levels of the job of

interest. The system will combine the above with related information

to provide estimated wages and a measure of the estimate's reliability.

—Endnotes—

<sup>1</sup> *Historical Statistics of the United States: Colonial Times to 1957*, Department of Commerce, Bureau of the Census, 1960, p. 101 ff.

<sup>2</sup> Joseph D. Weeks, "Report on the Statistics of Wages in Manufacturing Industries," *Tenth Census, 1880*, vol. 20, Department of Commerce, Bureau of the Census, 1886.

<sup>3</sup> Commissioner of Labor, *First Annual Report, 1886, Industrial Depressions*.

<sup>4</sup> Additional discussion of the combining of these programs may be found in John E. Buckley, "BLS Redesigns Its Compensation Surveys," *Compensation and Working Conditions*, September 1996, pp. 19-21.

<sup>5</sup> The Standard Occupational Classification System is being revised and the COMP2000 program will convert to the new system when it is available.

<sup>6</sup> The Federal Factor Evaluation System is used to assure comparability in levels among occupations under the General Schedule. Actual grades for individual occupations are based on more specific descriptions relating to an occupa-

tional series.

<sup>7</sup> The General Schedule Supervisory Guide uses six elements: Program scope and effect, organizational setting, supervisory and managerial authority exercised, personal contacts, difficulty of typical work directed, and other.

<sup>8</sup> For a discussion of job evaluation plans, see Thomas H. Patton, *Fair Play*, Jossey-Bass, San Francisco, 1988.

<sup>9</sup> Results will be available in several formats including ASCII files on the World Wide Web, and also as bulletins available for sale from the Bureau of Labor Statistics, Publications Sales Center, P.O. Box 2145, Chicago, IL 60690-2145. ASCII files are available on the Bureau's Web site: <http://stats.bls.gov/comhome.htm>

<sup>10</sup> A consolidated metropolitan statistical area (CMSA) is any area with over 1 million inhabitants that includes separate component areas or primary metropolitan statistical areas (PMSA's) and meets statistical and other criteria specified by the Office of Management and Budget. An example is the Washington-Baltimore, DC-MD-

VA-WV CMSA which consists of the Washington, DC-MD-VA-WV, Baltimore, MD, and Hagerstown, MD PMSA's. A metropolitan statistical area has 50,000 to 1 million inhabitants such as Albany-Schenectady-Troy, NY or a freestanding area with 1 million or more inhabitants such as Atlanta, GA. The criteria for defining metropolitan areas are published in the Federal Register (55 FR 12143-12160, March 30, 1990). The nine economic regions are New England, Middle Atlantic, East South Central, South Atlantic, East North Central, West North Central, West South Central, Mountain, and Pacific.

<sup>11</sup> For a comparison of area pay levels to holiday and vacation provisions, see John E. Buckley, "Variations in Holidays, Vacations, and Area Pay Levels," *Monthly Labor Review*, February 1989, pp. 24-30.

<sup>12</sup> Federal General Schedule workers are classified in grades 1 through 15 using nine factors. Within grades, workers can advance from steps 1 through 10 through performance and length of service.