Employer-sponsored life insurance: a new look

For the first time, the Bureau of Labor Statistics derives average amounts of life insurance coverage for full-time employees of medium-sized and large private firms

Adam Z. Bellet

Employer-sponsored life insurance is an important source of survivor protection for working men and women. Benefits are available both to assist with immediate expenses and to make up for the loss of family income. Amounts of life insurance benefits can vary widely. As one example, white-collar workers more commonly receive benefits based on their salary, while blue-collar workers are more likely to receive a fixed-dollar benefit. This difference is pointed up in a new analysis, which looks at average life insurance amounts derived from all benefit formulas.

In 1988, 92 percent of full-time employees of medium-sized and large private firms participated in life insurance plans financed wholly or partly by their employers. Insurance protection at 10 years of service ranged from an average of $20,020 if earnings were $15,000 a year to $54,440 if earnings were $55,000. On average, amounts of insurance rose only slightly with length of service. Thus, at 30 years' seniority, benefits averaged $20,161 and $54,581 at the aforementioned earnings levels.

These findings are from an analysis of insurance plan provisions obtained through the Bureau of Labor Statistics' 1988 Employee Benefits Survey. Data were collected from U.S. private firms employing at least 100 workers. The survey, which did not include Alaska and Hawaii, used a sample of 2,493 establishments that represented almost 107,000 firms with more than 31 million full-time employees. Data are presented for all types of workers combined and separately for three broad occupational groups: professional and administrative, technical and clerical, and production and service workers. The first two groups together are often labeled white-collar workers, in contrast to the blue-collar production and service workers.[1]

The Bureau has been reporting on the incidence and characteristics of employer-sponsored life insurance plans since the inception of the Employee Benefits Survey in 1979. Included in its reports are tabulations on methods of determining basic life insurance (for example, percent of participants covered by earnings-based versus flat-dollar-amount benefit formulas) and on amounts of insurance available under various plans (such as the percent of workers covered by

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plans providing $5,000 or $10,000 of coverage).

This article reports on the first effort to utilize the data on plan provisions to derive information on *average amounts* of life insurance available to full-time employees, regardless of the formula used to compute benefits. Given the specific ages, salaries, and lengths of service incorporated in the analysis, the results provide a comprehensive measure of the life insurance protection provided by medium-sized and large private firms.

Type of analysis

To conduct the analysis, a computer model was developed that takes account of the variables that influence benefits under individual life insurance plans, such as salary and, in some instances, length of service. In addition, the model applies provisions for minimum and maximum benefits and rounds protection amounts as specified by the plan.[2] The model also factors in age-related benefit reductions, allowing review of the insurance available to older workers.

In performing the analysis, life insurance benefits were projected under the provisions of each insurance plan for employees at various assumed annual salary levels and lengths of service. Benefits were computed for an employee in mid-career (for example, age 40) and for older employees.

The same assumptions were applied to all three occupational groups studied, even though some of the salary levels would not be widely applicable in each group. That is, it is not likely that many production and service workers had a salary as high as $55,000, nor is it likely that many professional and administrative workers had a salary as low as $15,000 or $20,000, in 1988. Because benefit formulas may be designed for a specific group of workers having a known range of earnings, benefits shown at these unlikely earnings levels may not be meaningful. Hence, in examining the results of this analysis, one should focus on benefits at earnings levels that are appropriate for a particular occupational group.

Table 1. **Average life insurance coverage for full-time plan participants by annual salary and length of service, medium-sized and large private firms, 1988**

Years of service	Annual salary					
	$15,000	$20,000	$25,000	$35,000	$45,000	$55,000
All participants						
3 years	$19,735	$24,656	$29,430	$37,635	$46,028	$54,156
5 years	19,820	24,741	29,515	37,720	46,113	54,241
10 years	20,020	24,940	29,714	37,919	46,312	54,440
20 years	20,127	25,048	29,822	38,027	46,420	54,548
30 years	20,161	25,082	29,855	38,061	46,453	54,581
Professional and administrative participants						
3 years	23,579	29,617	35,518	45,870	56,785	67,536
5 years	23,599	29,637	35,538	45,891	56,806	67,556
10 years	23,927	29,965	35,866	46,218	57,133	67,884
20 years	24,122	30,160	36,061	46,413	57,329	68,079
30 years	24,185	30,223	36,123	46,476	57,391	68,142
Technical and clerical participants						
3 years	21,609	27,659	33,243	43,217	53,702	63,662
5 years	21,646	27,696	33,280	43,255	53,739	63,700
10 years	21,820	27,870	33,454	43,428	53,913	63,873
20 years	21,901	27,951	33,535	43,509	53,994	63,954
30 years	21,927	27,976	33,560	43,535	54,020	63,980
Production and service participants						
3 years	16,317	19,935	23,569	29,482	35,176	40,678
5 years	16,468	20,086	23,720	29,633	35,327	40,829
10 years	16,601	20,218	23,852	29,766	35,459	40,962
20 years	16,667	20,285	23,918	29,832	35,526	41,028
30 years	16,687	20,304	23,938	29,852	35,545	41,048

NOTE: Life insurance figures are average amounts prior to any age-related reductions in benefits.

Benefit levels

Table 1 shows the average life insurance amounts at the length-of-service and salary levels studied. In each occupational group, the benefit amount increased only slightly with service, yet rose significantly as salary increased. This is expected, as plans frequently base benefits on earnings and rarely on length of service.[3] White-collar workers had the greater average benefit available at all salary levels, with the disparity widening with increasing annual salary. Thus, at $15,000, white-collar benefits were 44 percent higher than blue-collar benefits, while at $35,000, they were 55 percent higher.

Average life insurance amounts for white-collar workers were more sensitive to salary changes than were those for blue-collar workers. For example, when salaries of white-collar workers increased 80 percent, from $25,000 to $45,000, average insurance benefits increased 60 percent. For blue-collar workers, the increase was 50 percent over the same salary range. The analysis for blue-collar workers in the upper salary ranges, though, may be skewed due to the aforementioned assumptions regarding the inapplicability of higher earnings to this occupational group. Over the lower applicable salary range of $15,000 to $25,000, when salary increased 67 percent, insurance increased 44 percent.[4] In any event, one would expect greater sensitivity of white-collar workers' in-

surance to salary changes because in 1988 nearly 80 percent of the white-collar participants in medium-sized and large firms had life insurance tied to earnings, compared with 50 percent of the blue-collar participants.

With life insurance benefits expressed as a percent of employees' annual salaries, average benefits for white-collar participants were always greater than annual salary, while for blue-collar participants that was true only at the lower salary levels. The following tabulation presents projected life insurance benefits as a percent of annual salary at 10 years of service:

	Annual salary		
Participants	*$15,000*	*$25,000*	*$55,000*
All plans	133	119	99
Professional and administrative	160	143	123
Technical and clerical	145	134	116
Production and service	111	95	74

As shown in table 2, dollar amounts of protection at any one salary level varied widely among the individual life insurance plans in the survey. Nevertheless, clusterings are apparent, reflecting the prominence of plans paying benefits equal to the annual salary or flat amounts such as $5,000, $10,000, and $20,000.

Life insurance for older workers

The Age Discrimination in Employment Act prohibits employers from discriminating against any person with respect to hiring, compensation, or privileges of employment based on the person's age. Originally, the Act protected individuals between ages 40 and 65, but as amended, it now applies to all employees 40 years of age or older.

One effect of the Age Discrimination in Employment Act is to ban mandatory retirement. Because of this, employees may choose to continue working past typical retirement age. For such employees, the cost of employer-sponsored life insurance may continue to increase, as the life expectancy of older workers declines. To compensate for this added cost, many employers have reduced the amount of life insurance protection afforded these workers.[5]

Life insurance provisions for older workers varied widely in medium-sized and large private firms. In 1988, plans covering 56 percent of full-time participants imposed benefit reductions for older workers. The amount of insurance was first reduced at age 65 in plans covering 57 percent of those participants with age-related reductions, at age 70 for 32 percent, and at other ages for the remaining 11 percent. A slight majority of the participants in plans specifying age-based benefit reductions could expect a single reduction in insurance; the remainder could expect more than one benefit decrease. A common arrangement in plans with multiple reductions was to lower benefits to 65 percent of prior coverage at age 65 and to 50 percent at age 70. White-collar participants more commonly were in plans with age-based reductions than were blue-collar workers.[6]

Table 2. **Percent of full-time life insurance participants by amounts of coverage at 10 years of service and selected annual salaries, medium-sized and large private firms, 1988**

Coverage	Annual salary					
	$15,000	$20,000	$25,000	$35,000	$45,000	$55,000
Total	100	100	100	100	100	100
Less than $5,000	4	4	4	4	4	4
$5,000–$9,999	11	9	9	9	9	9
$10,000–$19,999	49	20	19	18	17	17
$20,000–$29,999	11	35	33	5	6	6
$30,000–$39,999	22	8	9	32	4	4
$40,000–$49,999	3	19	2	2	28	1
$50,000–$59,999	1	3	20	7	5	37
$60,000–$69,999	(1)	2	2	1	4	1
$70,000–$79,999	(1)	(1)	2	17	1	1
$80,000–$89,999	—	(1)	—	1	(1)	3
$90,000–$99,999	(1)	(1)	(1)	(1)	17	1
$100,000–$109,999	—	(1)	(1)	2	1	2
$110,000–$119,999	—	—	—	—	1	15
$120,000 or more	(1)	(1)	1	1	1	5

[1] Less than 0.5 percent.

NOTE: Percentages are for life insurance amounts prior to any age-related reductions in benefits. Dash indicates no employees in the given category. Because of rounding, sums of individual items may not equal totals.

Table 3. **Average life insurance coverage for older full-time workers by age, length of service, and annual salary, medium-sized and large private firms, 1988**

Age and years of service	Annual salary					
	$15,000	$20,000	$25,000	$35,000	$45,000	$55,000
Age 65						
10 years' service	$17,355	$21,697	$25,884	$33,121	$40,516	$47,749
30 years' service	17,361	21,703	25,891	33,127	40,523	47,755
Age 70						
10 years' service	13,588	16,829	19,949	24,965	30,499	35,923
30 years' service	13,594	16,835	19,955	24,971	30,506	35,929
Age 75						
10 years' service	12,866	15,931	18,854	23,366	28,529	33,579
30 years' service	12,872	15,938	18,860	23,372	28,535	33,585

NOTE: Life insurance figures reflect policies in force prior to June 1989 Supreme Court decision; see note 5 in text.

Coverage for employees ages 65, 70, and 75 with 10 and 30 years of service is shown in table 3. As in table 1, there is little variation in benefit amounts based on length of service, and benefits still increase as salary increases. More significant is a 12- to 14-percent drop in protection at age 65 from comparable pay and service amounts unreduced by age provisions.[7]

As table 3 shows, the decline in benefits was most prominent after age 65, particularly between ages 65 and 70. Over this 5-year span, insurance amounts dropped 22 to 25 percent, depending on length of service and salary; between ages 70 and 75, the decline was 5 to 7 percent.

Table 4 presents the distribution of life insurance benefit amounts for older workers at the $15,000 and $35,000 salary levels. Prior to age-based reductions in coverage, 15 percent of participants at the $15,000 salary level had life insurance coverage of less than $10,000 (table 2). At age 65, however, 25 percent of plan participants had coverage of less than $10,000. The percent of employees who had less than $10,000 coverage continued to increase to 43 percent at age 70 and 48 percent at age 75.

At the $35,000 salary level, the percent of plan participants with less than $10,000 of coverage is lower than at the $15,000 level and does not rise as sharply as age increases. Only 13 percent of employees received these low benefits prior to age-related reductions, the figure increasing to 20 percent at age 65, 26 percent at age 70, and 30 percent at age 75. For purposes of comparison, the percent of employees earning $35,000 and having life insurance benefits of $70,000 or more fell from 22 percent prior to reductions to 6 percent at age 75. □

Table 4. **Percent of full-time life insurance participants by amounts of coverage at 10 years of service and selected ages and annual salaries, medium-sized and large private firms, 1988**

Coverage	Age and annual salary					
	Age 65		Age 70		Age 75	
	$15,000	$35,000	$15,000	$35,000	$15,000	$35,000
Total	100	100	100	100	100	100
Less than $5,000	11	10	17	15	22	18
$5,000–$9,999	14	10	26	11	26	12
$10,000–$19,999	46	17	40	25	37	27
$20,000–$29,999	12	10	8	12	7	10
$30,000–$39,999	15	27	7	20	6	20
$40,000–$49,999	1	5	1	4	1	3
$50,000–$59,999	(1)	5	(1)	4	(1)	3
$60,000–$69,999	(1)	2	—	1	—	1
$70,000–$79,999	(1)	13	(1)	6	(1)	5
$80,000 or more	(1)	3	(1)	1	(1)	1

[1] Less than 0.5 percent.

NOTE: Percentages shown reflect policies in force prior to June 1989 Supreme Court decision; see note 5 in text. Dash indicates no employees in the given category. Because of rounding, sums of individual items may not equal totals.

Footnotes

[1] Excluded from coverage in the survey are benefits for executive management, part-time, seasonal, and temporary employees, as well as for employees who are on regular travel assignments (such as airplane crews and long-distance truckdrivers). In addition to life insurance, the survey examines the incidence and detailed characteristics of health care, short- and long-term disability insurance, retirement, and capital accumulation plans, and a number of paid and unpaid time-off items. It also reports on eligibility for a variety of other benefits. Key findings of the 1988 survey are in *Employee Benefits in Medium and Large Firms, 1988*, Bulletin 2336 (Bureau of Labor Statistics, 1989).

[2] Provisions for maximum amounts of insurance, designed to limit benefits that are tied to earnings, are more common than provisions for minimums. Formulas providing benefits expressed as multiples of earnings (such as one or two times annual salary) commonly stipulate rounding rules; insurance amounts are most often rounded to the next higher thousand dollars.

[3] In 1988, 58 percent of life insurance participants in medium-sized and large firms were provided with a basic benefit expressed as a multiple of their earnings, and an additional 7 percent derived their benefit from a graduated schedule based on earnings. Of the remaining participants, 31 percent were provided with a flat benefit amount and 3 percent with a flat benefit based on service.

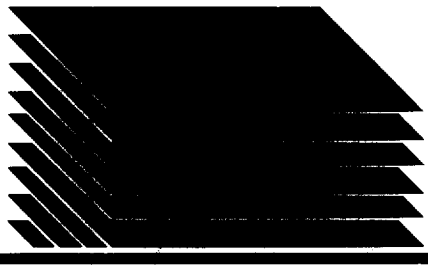
[4] Data from the Bureau's Employment Cost Index show average hourly wages and salaries of $11.84 for white-collar occupations in 1988, compared with $9.59 for blue-collar occupations. See *Employment Cost Indexes and Levels, 1975–1988*, Bulletin 2319 (Bureau of Labor Statistics, 1988), p. 48.

[5] Prior to June 23, 1989, reductions in life insurance benefits for older workers were governed by guidelines established in the U.S. Department of Labor's 1979 interpretive bulletin (29 CFR 860.120). These guidelines allowed benefit reductions if justified by increased costs. On June 23, 1989, the Supreme Court, in *Public Employees Retirement System of Ohio* v. *Betts*, ruled that the Department of Labor's cost-justification guidelines were invalid. Data in this article reflect life insurance plan provisions in effect prior to this ruling.

[6] For further information on age-related reductions in life insurance, see Michael A. Miller, "Age-related reductions in workers' life insurance," *Monthly Labor Review*, September 1985, pp. 29–34.

[7] Table 3 includes all plans in the survey. For those without age-based insurance reductions, the inputs are the same as those for table 1. The differences between the two tables would be greater if each were restricted to plans calling for age-related reductions in life insurance benefits.

Conference papers



Twenty-two BLS analysts presented papers at the Sesquicentennial Program of the American Statistical Association, August 6–10, 1989, in Washington, DC. The paper by Commissioner of Labor Statistics Janet L. Norwood and Deborah P. Klein is presented in full on pp. 14–19 of this issue. Summaries of the presentations of other BLS participants appear below.

Abstracts of the papers have been published by the American Statistical Association in *1989 Program and Abstracts—Joint Statistical Meetings*. For copies of individual papers, write to the author, Bureau of Labor Statistics, 441 G Street N.W., Washington, DC 20212.

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Thomas J. Plewes, "Pointing the Way: Data, Analysis, and Decision-making."

The role that statistics play in allocation of Federal funding for transfer payments to other units of government, in escalation of tax rates and payments to individuals, and in determining the distribution of seats in the House of Representatives is well known. Less well understood is the role that statistics play in the process of formulating decisions and evaluating results.

As the statistical arm of the Department of Labor, the Bureau of Labor Statistics attempts to direct its program to support understanding of issues of current importance. Plewes discusses the relationship between statistics and decisionmaking, examining the changing role of the Bureau in collecting, analyzing, and publicizing data of importance in policy formulation. The challenges posed by the impact of new technology and the increasing sophistication of policy analysis are explored.

Plewes details the linkage between data and policy in three special data collections on issues of national importance—dislocated workers, day care, and drug testing in industry. He points out that the statistical agency is emerging as an honest-broker, causing a tension between the need for objectivity and policy relevance that agencies must confront on a daily basis.

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Penny L. Asbury, "A Survey on the Temporary Help Supply Industry."

The Bureau of Labor Statistics has been conducting and publishing wage surveys of specific industries since the first annual report of the Commissioner of Labor in 1886. In a continuing effort to cover emerging industries, the Bureau conducted its first occupational wage survey of the temporary help supply industry in 1987. The decision to undertake this study was influenced by the rapid growth of the industry in recent years.

One of the many challenges of this survey was to develop a sample design that balanced the need for national and locality data within extreme budget constraints. Federal policymakers required national data to assess the impact that the industry's growth has had on the total economy. Other data users needed statistics that reflected the industry's locality-based wage structure. To yield results that met the needs of both types of data users, a sample design was developed that allowed the data to be published nationally, for 26 localities, and also, in combination, for large metropolitan areas.

The results of the survey showed that hourly wages in this industry are variable and locality based. The large metropolitan areas, which employed 61 percent of the industry's workers, consistently had higher pay levels than the industry's national averages. However, even among the individual metropolitan areas, some differences were large for the same occupations. For other occupations, area differences were not as great, depending on the number of employees in the occupation and on the specificity of the occupational definitions.

The sample design very effectively uncovered the high variability among the areas in the locality data and provided a basis for understanding the national averages. As expected, the wage structure for the temporary help supply industry proved to be locality based, but due to the broad interest in temporary help supply workers and their wages, any future survey of this industry must also develop national statistics.

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Terry M. Burdette, Steve Cohen, and C. Joseph Cooper, "Recent Changes in the White-Collar Pay Survey."

Since 1959, the Bureau of Labor Statistics has conducted an annual pay survey in selected professional, administrative, technical, and clerical occupations (the PATC survey). Since its inception, the survey has been related to the paysetting process for white-collar employees of the Federal Government. Over time, this survey has gradually expanded in geographic and industrial coverage, and in the number of occupations studied. It is currently the only probability based source of white-collar salary data by occupational work level.

Since 1985, the survey scope has been expanded from 45,000 establishments to more than 285,000 establishments. This increase was accomplished by lowering the minimum employment size of the establishments to be surveyed to a uniform 50 employees for all industries, and by adding the private service industries not previously studied.

These expansions were carried out by surveying segments of the goods-producing and service-producing sectors in alternate years. This paper describes the resulting changes in the sample design, the estimation process used to combine the separate segments into all-economy data, and the effects that the expansion had on survey estimates.

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Jaqueline A. Richter, "Integrating the Employment Cost Index and the Employee Benefits Survey."

In response to a request from Congress to improve statistics for white-collar pay and benefits, the Bureau of Labor Statistics will integrate the Employment Cost Index (ECI) and the Employee Benefits Survey (EBS), with common data collection beginning in 1990. The quarterly ECI focuses on the employer cost of wages and benefits. The EBS focuses on benefit plan provisions, with data for half its scope being published each year.

Integrating the two surveys will permit associations between many benefits and costs, elimination of duplicate data collection, and publication of benefit provisions in small establishments. Suitable common definitions, scopes, and data collection methods are needed. The reliability of the estimates should be maintained or improved.

The ECI program will continue to collect all data during an initiation personal visit to a sample establishment and then update these data quarterly for 4 years. The EBS will remain an annual survey, with all data collected during the initiation and updated in the appropriate survey year.

The EBS will adopt the ECI method of selecting a sample of occupations within an establishment, with probability proportionate to occupational employment. Simulations on data from the 1986 EBS indicate that the quality of the published data will not change.

A successful small firms test collected EBS data from establishments with fewer than 50 employees. Another test collected EBS data by telephone, with no difficulty, for the 75 percent of ECI establishments which will already be in the sample at the time joint collection starts. The results of a data collection test currently in the field will help determine the most efficient way to collect the joint data.

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Charles C. Mason, Mary Lynn Schmidt, Robin Duncan, and Nathan Amble, "A Comparative Analysis of Price Indexes Produced by National Governments for Older Consumers."

The United States currently does not produce a price index based solely on the price and expenditure experience of older citizens. However, the United Kingdom, Canada, and Japan do produce such indexes. The Bureau of Labor Statistics has calculated an experimental price index for older consumers for the period January 1983 through March 1988. In this paper, the results of the experimental index are presented and compared to the price index behavior reported by those countries producing similar statistics.

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Judith Hellerstein, "The Effects of Sample Size on Variances of the Producer Price Index."

This paper describes a simulation study which was conducted to examine the variances of the Producer Price Index (PPI). In the study, price data from six lowest-level publication cells in six different industries were examined. Price indexes and variances for each cell were computed for 13 months of data (January 1987–January 1988). Subsampling using various subsample sizes was conducted for each cell. The variances computed from the indexes of each subsample size were then compared to the variance computed for the full PPI sample of each cell.

The results in each cell indicated that, in all cases, sample size reductions led to increased variance levels. This is consistent with statistical theory. However, there was no constant proportionality between sample sizes and variances. The existing relationships are examined and discussed in detail as they related to differences in the underlying economic characteristics of each cell.

The results of this study illustrate the importance of sample size to PPI data. The number of price quotes used in the estimation of price change in an industry can have dramatic effects on variances and the quality of published indexes. Future research will focus on developing industry-specific models for predicting variances based on the inherent economic characteristics of each particular industry. These models will then be used to better distribute PPI sample allocations across industries and to predict the gradual deterioration of samples to ensure that timely resampling takes place.

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Chester H. Ponikowski and Sue A. Meily, "Controlling Response Error in an Establishment Survey."

Response error may be defined as the difference between the value obtained from the survey and the desired or true value.[1] Frequently, business establishment records used for responding are not consistent with specific survey definitions. At the Bureau of Labor Statistics, a record check technique has been used in the Current Employment Statistics (CES) survey to identify and control response errors resulting from records used for responding.

The CES record check instrument compares the survey definitions to the establishment's recordkeeping system. The objectives are to identify definitional differences in recordkeeping and to request that deviations be corrected in future reports. To prolong correct reporting, a form is sent to the respondent listing adjustments to the reported data which the respondent agreed to make. The interviews are conducted by telephone using Computer Assisted Telephone Interviewing (CATI), which is less expensive than personal visits.

The results obtained from the CES CATI record check survey provide information on the percentage of reports needing adjustments and the percentage of reporters agreeing to adjust.[2] Errors which occur most frequently within each data item are identified. These percentages provide an indirect measure of the response error in the survey. Overall, a substantial percentage of respondents require some ad-

justment to their reported employment; two-thirds of these respondents agreed to make the adjustments. However, many of the errors occur infrequently or affect only a small percentage of the employees at an establishment. Also, there is a canceling effect at the aggregate because some of the error sources produce a positive bias, while others result in a negative bias. A direct measure of response error computed from a previously conducted record check survey indicates that reporting errors would result in less than one percent bias in total employment estimates.[3]

The quality of the Current Employment Statistics survey is reflected in its total survey error: annual revisions to total employment estimates have averaged 0.2 percent over the last five years. The continued focus on controlling response error will further reduce the magnitude of annual revisions. Beginning in 1990, a modified record check survey will be conducted for all CES reporters with 250 or more employees.

[1] M. H. Hansen, W. N. Hurwitz, and M. A. Bershad, "Measurement Errors in Censuses and Surveys," *Bulletin of International Statistical Institute*, no. 38, 1961, pp. 359–74.

[2] Chester H. Ponikowski and Sue A. Meily, "Controlling Response Error in an Establishment Survey," *ASA Proceedings of the Section on Survey Research Methods*, forthcoming.

[3] G. S. Werking, A. R. Tupek, and R. L. Clayton, "CATI and Touchtone Self-Response Applications for Establishment Surveys," *Proceedings of the U.S. Bureau of the Census Annual Research Conference*.

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Lawrence Boehm, "Reliability of Proxy Response in the Current Population Survey."

Self-other differences in knowledge and cognitive processing are of practical importance to survey researchers because a number of national surveys allow "any responsible" adult member of a household to respond for all the members of that household. Such proxy responses are permitted in the Current Population Survey (CPS) and account for approximately 50 percent of the interviews conducted. The CPS is a monthly survey of approximately 59,000 households in the United States, from which monthly estimates of labor force status (employed, unemployed, and not in the labor force) and related characteristics are developed.

A laboratory study evaluating the reliability of proxy responses in the CPS has been conducted. The study involved interviewing two members of household using the CPS questionnaire. Subjects answered questions for themselves (self response) and for the other family member (proxy response). Thus, it was possible to compare the proxy response to the self response for each person. Respondents also provided a confidence rating of their ability to report acceptable answers and a rating of their knowledge of the other person's job or job search.

Responses from self and proxy respondents were generally correlated, yet proxy respondents disagreed with self respondents on 30 percent of the CPS questions. Further, it was not uncommon for proxy respondents to provide data that resulted in different labor force classifications, especially when responding for those not in the labor force and the unemployed. Although the study found that proxies' knowledge and confidence ratings were generally high, the ratings were unrelated to performance, suggesting that screening proxy respondents on the basis of self-rated confidence or knowledge would not be useful.

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Maria P. Fracasso, "Reliability and Validity of Response Categories for Open-Ended Questions in the Current Population Survey."

For open-ended questions, the interviewer is the interpreter of information, and hence frequently must classify respondent answers to fit into response categories. However, when interpretation takes place, errors may occur. The labor force section of the Current Population Survey (CPS) contains several open-ended questions.

The present research has focused on the reliability and validity of the current categories as well as CPS interviewers' interpretation and categorization of respondents' answers to these open-ended questions. Based on the apparent underuse of some present CPS category choices and overuse of the "other" category, an alternative set of category choices was designed. Actual CPS interviewers and expert CPS analysts used a sorting technique to classify responses into either the present or an alternative set of category choices for each of the open-ended questions.

This paper discusses the usefulness of alternative versus present category choices in facilitating use of all category choices and eliminating the potential for misclassification of individual responses. In addition, it examines the consistency with which interviewers and experts categorize responses for the open-ended CPS questions.

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Mark Palmisano, "Respondent Understanding of Key Labor Force Concepts Used in the CPS."

This paper discusses research identifying conceptual and wording difficulties in the Current Population Survey (CPS) questionnaire which may influence the classification of an individual's labor force status. The purpose of this research has been to determine whether the same operational definitions of the phrases and words used in the CPS labor force classification questions are shared among individual respondents and between respondents and the survey designers. Focus groups have been conducted using paraphrasing and probing techniques to evaluate respondents' interpretation of CPS questions.

Analyses of the results have verified the presence of at least one particularly ambiguous concept—"on layoff." Alternative questions have been developed based on results obtained thus far. A method to evaluate the relative data quality of these alternative questions also has been developed, and further laboratory tests and field tests are planned to confirm these results.

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Leslie A. Miller, "Improving Comprehension and Recall in the Consumer Expenditure Interview Survey."

Survey research often involves written questionnaires administered by personal interviews. Literature documents the care that must be taken in designing

such interviews to minimize reporting errors. Two concerns of the present work on the Health and Medical Expenditure section of the Consumer Expenditure Interview Survey were possible lack of comprehension and the inability to stimulate recall when lengthy recall periods are involved.

The research reported here extends the recent integration of survey methodology and cognitive psychology by attempting to increase comprehension and recall abilities through the use of investigative laboratory techniques. Preliminary methodology included: focus groups, probing, paraphrasing, protocol analysis, and questionnaire revisions. Matching of written versus oral responses was used to obtain response reliability. Current feasibility field testing of the revised forms will indicate whether the procedures used to increase comprehension and to improve recall will be replicated and expanded to the rest of the questionnaire.

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Arthur L. Hughes and Flora K. Peitzmeier, "Weighting and Imputation Methods for Nonresponse in CPS Gross Flows Estimation."

Estimates of month-to-month gross flows in the Current Population Survey (CPS) can provide insight into the movements underlying the month-to-month net change in the cross-sectional (stock) data. However, the usefulness of gross flows data is substantially weakened because of significant errors such as bias due to nonresponse. Also, gross flows data are inconsistent with the monthly stock data. The current gross flows nonresponse adjustment methodology consists of revising the tabulated data so that agreement with the current month's independently derived male and female population estimates is achieved.

In this paper, the current nonresponse adjustment procedure and several alternative procedures were evaluated based on a simulation study. Gross flows data are based on CPS sample persons who match in two consecutive months. In the simulation study, some of the respondents were designated as partial nonrespondents (individuals with a response in one month but not the other), and each adjustment procedure was applied.

Results of the simulation study indicate that multiple imputation is superior to the other procedures, producing a nonresponse bias that is one-fourth as large as the bias from the current method. The multiple imputation procedure "fills in" the nonrespondents' missing values with two or more values from a pool of respondents. A weighting procedure was second best, producing a nonresponse bias that is one-half as large as the bias from the current method. In this method, the sampling weights of the respondents were adjusted to account for partial nonrespondents within specified labor force and age categories.

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Richard Clayton and Louis Harrell, "Developing a Cost Model for Alternative Collection Methods: Mail, CATI, and TDE."

The publication of high quality economic data begins with collecting accurate data on a timely basis from our respondents. As a part of ongoing improvement efforts, research began at BLS in 1984 to investigate methods of improving the timeliness and accuracy of collection in the Current Employment Statistics (CES) program. The CES is a monthly survey of establishments providing some of the earliest information on the health of the U.S. economy. There is a growing array of data collection methods available through advances in technology, each with differing characteristics affecting the cost and error structure of survey operations.

Computer Assisted Telephone Interviewing (CATI) involves interviewers calling respondents and directly entering answers in a computer which instantly edits the data and provides other improvements. Thus, CATI combines the power of inexpensive computers and the strengths of direct telephone contact with respondents to collect accurate data in a short, controllable timeframe. This powerful tool dramatically improves the collection of time-critical information, but may be more expensive than the mail questionnaire process currently used. Under Touchtone Data Entry (TDE), the respondent calls a computer which uses digitized phrases to ask the survey questions. The respondent enters data and answers other questions by pushing the appropriate pads of a touchtone telephone. TDE maintains the high response rates available under CATI, and eliminates many of the costly, labor intensive activities of both mail data collection and CATI.

In providing a generalized approach to evaluating alternatives, this paper discusses each method, its costs and performance measures, as well as other implications of employing automated collection methods. Current cost and performance measures are combined into a single overall yardstick for comparison, and future costs are estimated to provide additional insight to survey planners considering alternative collection methods.

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Clyde Tucker, "Characteristics of Commercial Residential Telephone Lists and Dual Frame Designs."

A particularly attractive type of telephone survey design combines information from a sample drawn from a directory of residential numbers and a supplementary sample selected through Random Digit Dialing (RDD). Use of the list can not only save time and money but also increase response rates if the list sample residences are contacted by mail prior to the survey. The RDD supplement is needed to provide coverage for numbers not on the list. Unfortunately, the effectiveness of this design depends upon characteristics of the list which often are not available to the user.

This paper addresses the problem by examining the characteristics of lists for four sample areas in the Bureau of Labor Statistics Current Point-of-Purchase Survey. These sample areas vary by size and geography. Among the issues considered are the cost of the lists, how they are constructed, their accuracy, and their usefulness for improving survey efficiency.

Carol Spease, "Comparison of Variance Estimators for Producer Price Index Data."

In an effort to measure sample variability in the Producer Price Index (PPI), the Bureau of Labor Statistics is evaluating variance estimators based on a sample replication method. The method, called balanced half-sample replication, is commonly used in surveys that have a complex sample design and in which a ratio, such as the PPI, is estimated.

In this paper, a simulation study is described. Three estimators of variance of the long-term index using the balanced half-sample method were computed and compared to determine which form of the estimator is most appropriate for PPI data. The comparison of the estimators was based on three criteria that measure the accuracy of the estimators.

In the study, 19 months of actual price data from three manufacturing industries were used. Original sample units (companies) formed finite populations for sampling in the simulation study. Repeated samples were drawn from the populations, and indexes, variances, and comparison statistics were computed and averaged over all samples drawn.

As a result of the study, one of the estimators was found to perform best on the PPI data. The observed variance estimates of the best variance estimator were closer to the true population variance than the other two variance estimators, which at times severely underestimated the true population variance. Also, when confidence intervals were formed around each of the sample indexes based on the size of the corresponding sample variances, the intervals formed using the best variance estimator contained the true population index more often than the intervals formed using the other two variance estimators.

The estimator found in the study to be the best estimator of the variance of the long-term index will be incorporated into the Bureau's index estimation system and variances of the estimates will be computed on a routine basis. Eventually, the index variances will be published along with the index values.

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Richard Tiller, "A Kalman Filter Approach to Labor Force Estimation Using Survey Data."

A new approach to estimating Statewide employment and unemployment in 39 States and the District of Columbia was introduced by the Bureau of Labor Statistics in 1989. It is based on a time series model that treats the observed monthly labor force estimate from the Current Population Survey (CPS) as the sum of an unobserved true labor force value plus an error arising from sampling only a portion of the population. The true values are represented by a dynamic regression equation that uses data on the insured unemployed and payroll employment as explanatory variables with time varying coefficients.

Each month, as new CPS sample data become available, an algorithm known as the Kalman filter is used to estimate the true labor force by combining current and past sample data with data on the explanatory variables. The purpose of this approach is to reduce the effect of high variance in the Statewide CPS estimates due to small sample sizes.

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John T. McCracken, "The International System of Labor Statistics."

The International Labor Organization (ILO) is a constituent body of the United Nations with 154 member countries. Its mission is to establish and improve standards of work and living conditions throughout the world. Labor statistics are essential to this mission. The ILO publishes data on the economically active population of nations, including estimates of the employed and unemployed, hours of work and wages, costs, consumer price indexes, occupational injuries and diseases, strikes, and lockouts. Many countries lack a complete range of labor statistics, while others seek to overcome problems of poor data quality.

To achieve universal availability and quality of data, the ILO develops standards for labor statistics and assists developing nations in instituting statistical systems through recommendations and technical aid. ILO Conferences of Labor Statisticians develop standard concepts, definitions, methodology, and publication criteria to promote high quality and to facilitate international comparisons and analysis. The standard-setting decisions of the ILO take the form of Conventions or of Recommendations. From a constitutional and legal standpoint, there is a fundamental difference between the two types of decisions. Conventions are designed as obligation-creating instruments. On the other hand, Recommendations are designed as guidance-providing instruments.

In 1985, the ILO adopted Convention 160 concerning labor statistics. Ratifying countries will be obligated to produce labor statistics in nine program areas using internationally adopted standards. The required statistics cover the economically active, the employed and unemployed, earnings and hours, wages, labor costs, consumer prices, household expenditures, occupational injuries and diseases, and industrial disputes. The Convention provides guidance for concepts and definitions, and for collecting, compiling, and publishing data.

The U.S Senate is expected to ratify this Convention in the late fall of 1989. The Convention is an essential tool in establishing a universal system of high quality labor statistics. The BLS international comparisons program measuring how the United States is faring in relation to other countries will be greatly enhanced by the adoption of Convention 160 by the nations of the world. □