

BLS at 125: using historic principles to track the 21st-century economy

Relying on its core principles of objectivity, confidentiality, relevance, accuracy, and transparency, as well as a core set of disciplines—economics, statistics, information technology, and behavioral science—the Bureau of Labor Statistics at 125 has incorporated new labor phenomena arising over the past quarter century into its repertoire of programs and services

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The U.S. Bureau of Labor Statistics (BLS) used its centennial in 1984 as “an opportunity to reflect on what we can learn from history and a time to think about emerging problems and their implications” for the future.¹ At that time, it would have been hard to imagine the growth and change in the economy over just a quarter century—and the growth and change at the BLS designed to keep up with the changing economy. Remarkably, some things that could not have been imagined in 1984 are now commonplace at the BLS: the use of the Internet for data collection and dissemination, computers on every employee’s desk, staff telecommuting, distance training via video and computer, cognitive review to improve the clarity and accuracy of BLS questionnaires and publications, blogs and wikis, and more. But all of these changes are needed to track an economy that is increasingly global, lightning fast, and constantly being reinvented. Gone are the days when the BLS counted girdle manufacturers and stenographers. To keep up with the world of satellite communications and nanotechnology, the Agency had to reinvent itself.

The 100-year anniversary was marked with the publication of a volume that traced the growth of the BLS through the terms of 10

Commissioners.² Although each Commissioner left his or her own mark, all supported and expanded upon a core set of principles to guide the organization and its work. An additional quarter century may not deserve another historic volume; rather, this article is intended as an update of BLS activities over the past 25 years. And while Commissioners have come and gone, the guiding principles remain, having been tested and strengthened. This look back is organized not by time or by program, but by those principles, which are still relevant today. A brief introduction will provide some context on how these principles manifest themselves in today’s BLS.

What is the BLS?

Those not familiar with the BLS are nonetheless often aware of some of the key measures and data that come from the Agency, including the monthly Consumer Price Index (CPI), the unemployment rate, and payroll employment figures. In fact, nearly every American is affected by some BLS data, most notably annual adjustments to Social Security payments and Federal income tax brackets, both of which result from changes in the CPI. The relative anonymity of the BLS is perhaps a byproduct of its commitment to objectivity:

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the statistics, not the agency that produces them, are the story. And although the measures just cited are among the most widely known, the BLS actually produces data from about two dozen programs covering such topics as employment, prices, spending, compensation, workplace safety and health, and productivity. These programs vary widely: some are large while others are small, and some offer broad overviews of the economy while others are rich in detail. Exhibit 1 provides a look at the current programs of the BLS.

The BLS is the principal factfinding agency for the Federal Government in the broad field of labor economics and statistics. As specified in its mission statement, the BLS “collects, processes, analyzes, and disseminates essential statistical data to the American public, the U.S. Congress, other Federal agencies, State and local governments, business, and labor.”³

In the sections that follow, the principles that guide the work of the BLS have been grouped into five categories that describe the current focus of the Agency’s activities. Of course, any such grouping is arbitrary, and other combinations might be as good or better at allowing readers to understand the tenets that go into producing high-quality labor statistics. Similarly, the examples that accompany each principle often speak to multiple principles. Nor are the examples exhaustive; other ones could easily have been substituted. The intent, however, transcends the particular examples chosen: to provide an illustration of the variety of challenges facing the BLS in the 21st century and of how a set of principles continues to guide the reactions to those challenges.

Objectivity, fairness, and impartiality

The BLS is an agency of the U.S. Department of Labor, but is also an “independent statistical agency,” meaning that it is not involved in policy decisions. Although BLS data frequently are used by policymakers to formulate regulations, enact legislation, and illuminate the outcomes of new policies, the staff who produce these data have no role in developing or enforcing policy. Underscoring this independence, the BLS has but one political appointee: the Commissioner. Commissioners are nominated by the President, are confirmed by the Senate, and serve fixed 4-year terms. Their terms do not necessarily coincide with those of Presidents; for example, the current BLS Commissioner, Keith Hall, was appointed by President George W. Bush and continues to serve under President Barack H. Obama.

Despite this independence, many individuals and organizations try to draw the BLS into the policy arena. An example of this phenomenon occurred repeatedly during 2008, as the Agency reported on reductions in payroll

employment. The BLS frequently was asked whether the declining employment figures meant that the U.S. economy was in a recession. In response, the BLS explained that such a declaration was not within its purview. The official declaration of a recession, as well as details of the specific timing of the business cycle, is made by the National Bureau of Economic Research (NBER), a nongovernmental independent research organization.⁴ Data from the BLS can inform the issue, however; for example, the BLS can provide information from previous recessions on job losses and the amount of time that it took for employment to recover to its prerecession peak.

Attempts to draw the BLS into policy issues invariably come from external sources. For instance, Congress may include language in legislation that requires the BLS to conduct certain policy-related analysis, and other Federal Government Agencies may request that the BLS be involved in similar policy analysis. Such requests are turned down and in many cases are transferred to the relevant policy Agencies within the Department of Labor. (BLS statistical programs often have a parallel policy and enforcement agency, such as the Occupational Safety and Health Administration or the Wage and Hour Division of the Employment Standards Administration.) An example of the type of policy analysis that frequently is requested of the BLS is an analysis of the effect of increases in the minimum wage on employment. Although the BLS may provide information on the number of workers earning at or below the minimum wage and information on the characteristics of those workers, such as their demographics and educational attainment, the BLS does not predict the effect of changes to the minimum wage.

Beyond avoiding policy discussions, the BLS often includes caveats about its data to caution readers against drawing certain conclusions. For example, the following caution appears in the BLS news release of data comparing union and nonunion earnings:

The difference [between union and nonunion earnings] reflects a variety of influences in addition to coverage by a collective bargaining agreement, including variations in the distributions of union members and nonunion employees by occupation, industry, firm size, or geographic region.⁵

A second example, from the annual *Highlights of Women’s Earnings*, is about differences in earnings between men and women:

In 2007, women who were full-time wage and salary workers had median weekly earnings of \$614, or

Exhibit 1. Statistical programs of the Bureau of Labor Statistics, 2009

| BLS statistical program | Major outputs | Origins | Significant events in past 25 years |
|---|---|--|--|
| American Time Use Survey (ATUS) | Annual and quarterly estimates of how, where, and with whom Americans aged 15 years and older spend their time | New program began in 2003; first federally funded continuous time-use survey in the United States. | Only Federal survey providing data on the full range of non-market activities, from childcare to volunteering; the U.S. Department of Agriculture sponsored secondary questions on eating and general health in 2006–08. |
| Business Employment Dynamics (BED) | Quarterly data series on gross job gain (openings and expansions) and gross job losses (closings and contractions) | Data for the BED are generated from the Quarterly Census of Employment and Wages (QCEW) program; national data were first published in 2003. | The following data series or expansions were added after 2003: industry detail in 2004, size class data in 2005, State data in 2007, size-of-change data in 2008. |
| Census of Fatal Occupational Injuries (CFOI) | Annual counts and rates of workplace fatalities | New program began in 1992; data previously captured as part of injury survey. | Began in 1992; provided special report on at-work fatalities as a result of the terrorist attacks of September 11, 2001; recently introduced rates based on hours worked. |
| Consumer Expenditure Survey (CE) | Information on the buying habits of American consumers, including average annual expenditures and details by expense category such as food, housing, health care, and entertainment | Conducted periodically since 1888. As the independent Diary and Interview surveys, continuously since 1980. To provide the basis for revising the weights and associated pricing samples for the CPI and to provide timely and detailed information on the spending patterns of consumers. | Numerous data collection improvements, including the major transition to computer-assisted interviewing in 2003–04. Variance data published starting in 2000. Imputation of missing income fields starting in 2004. Sample redesigns in 1986, 1996, and 2005. |
| Consumer Price Index (CPI) | Price indexes; selected average prices | Price indexes from 1913 forward | Introduced rental equivalence in 1983; introduced geometric mean formula in 1999; implemented biennial weight updates in 2002; added the Chained CPI-U in 2002. |
| Current Employment Statistics (CES) | Employment, hours, and earnings for the Nation, States, and metropolitan areas | The first monthly studies of employment and payrolls by BLS began in 1915 and covered four manufacturing industries. Several States were producing employment statistics prior to 1915. | In the early 1990s, the mail-based CES program began a transition to automated data collection methods. By 2006, nearly all collection was done by automated techniques. In June 2003, the BLS completed a comprehensive sample redesign. Prior to 2003, the survey utilized a quota sample whose inception in the 1940s predated the introduction of probability sampling as the internationally recognized standard for sample surveys. In 2006, BLS introduced hours and earnings series for all employees, to supplement the traditional production and nonsupervisory worker hours and earnings data. |

| Exhibit 1. Continued—Statistical programs of the Bureau of Labor Statistics, 2009 | | | |
|--|---|--|--|
| BLS statistical program | Major outputs | Origins | Significant events in past 25 years |
| Current Population Survey (CPS) | Unemployment rate and demographic characteristics of the labor force | Monthly collection of the CPS began in 1940 as a Work Projects Administration project. Responsibility for the planning, analysis, and publication of labor force statistics from the CPS was transferred to BLS in 1959. | Periodic supplemental surveys were developed on a variety of topics, including displaced workers (introduced in 1984), disabled veterans (1985), home-based work and flexitime (1985), contingent and alternative work arrangements (1995), and volunteering (2002). A significant redesign of the survey was introduced in 1994, including computerization of the instrument, changes to the questionnaire, and the availability of new data. Survey questions on nativity (1995) and new race/ethnicity categories (2003) were added. Special questions to identify Hurricane Katrina evacuees were added to the CPS from October 2005 to October 2006. Collection of monthly data on persons with disabilities began in 2008. |
| Employment Projections | Long-term industry and occupation employment projections; information for career planning and for planning education or training | First projections and career information published in 1949; prepared on a biennial basis since then. | Began publishing <i>Career Guide to Industries</i> in 1992. Incorporated offshoring analysis system into projections process starting with 2004–14 projections. |
| Import and Export Price Indexes | Prices indexes covering U.S. exports and imports of goods and selected services | First series started in 1971. Full coverage reached in 1983. | Shifted from quarterly to monthly basis in 1989; in 2004, began switching from a mail survey to collecting data via a Web-based application. |
| Industry Productivity and Costs | Annual measures of labor productivity and unit labor costs for detailed industries | Studies of output per hour in individual industries date back to the 1800s. | The number of industries covered by labor productivity measures has more than tripled over the last 25 years. Aggregation of detailed outputs was improved in 1995 by introducing value-weighted chained superlative indexes in place of unit labor requirements weights. Labor compensation and unit labor cost series were introduced in 1999. CPI research series were incorporated in 2001 for deflating some industry receipts. Improvements were made to hours estimates for nonproduction and supervisory workers. |
| International Labor Comparisons | Annual and monthly data comparing the United States with more than 30 countries on one or more of the following measures: employment counts and unemployment rates, productivity, hourly compensation costs, and Consumer Price Indexes | BLS has reported on foreign labor developments and statistics since its earliest days; a program to develop internationally comparable labor statistics began in the 1960s and was among the first of its kind. | Regular publication of data comparing compensation per hour for manufacturing workers began in the 1990s, and country coverage has been expanded significantly in the 2000s. A chartbook on the international labor situation was first published in 1995; annual publication of the chartbook began in 2006. Special studies have been completed on labor underutilization, the family and work, Mexico's labor market, and China's manufacturing employment and labor costs. |

Exhibit 1. Continued—Statistical programs of the Bureau of Labor Statistics, 2009

| BLS statistical program | Major outputs | Origins | Significant events in past 25 years |
|---|--|---|--|
| International Technical Cooperation | Provides technical assistance on labor statistics to economists, statisticians, and policymakers throughout the world. Coordinates BLS participation in international cooperative activities. | Carroll Wright, the first BLS Commissioner, strongly supported and encouraged international cooperation activities. BLS international technical assistance programs formally began as part of the Marshall Plan to rebuild Europe and Japan following World War II. | This program expanded during the early 1990s to assist statistical agencies in new democracies in eastern Europe. BLS activities included sponsoring an international conference on statistical needs of economies in transition. Since 2001, demand to conduct BLS technical assistance programs overseas has grown. Today, BLS staff conduct training programs and serve as consultants under the auspices of international organizations and direct foreign government sponsorship in countries throughout the world. |
| Job Openings and Labor Turnover Survey (JOLTS) | Monthly rates and levels of job openings; monthly and annual rates and levels of hires, quits, layoffs, discharges, and other separations | New program begun in 1999. Data series starts with December 2000. | Program began collecting data in 2000. Began releasing monthly data as a developmental series in July 2002. Became official BLS series in April 2004. |
| Local Area Unemployment Statistics (LAUS) | Monthly and annual average estimates of the labor force, unemployment, and the unemployment rate for nearly 7,300 areas that geographically exhaust the United States | Program was transferred to BLS from another DOL agency in 1972. | The first stand-alone PC-based estimating system was provided to States in 1983. Modeling of estimates for States was initiated in 1989, and two newer generations of models have been implemented since then. A major redesign of the program was completed in 2005. |
| Major Sector Productivity and Costs | Quarterly and annual measures of output per hour and unit labor costs for the nonfarm business sector and other sectors | Total private-sector labor productivity measures were first published in 1959; BLS switched to the “business sector” in 1976. | After extensive consultation with the Bureau of Economic Analysis (BEA), in 1996 BLS switched its business-sector output measures from the “income side” to the “product side” of the National Income and Product Accounts and also based these measures on BEA’s new “chain-type annual indexes.” These improvements have reduced the number of revisions to the series. |
| Mass Layoff Statistics (MLS) | Plant closings and mass layoffs involving at least 50 people who filed unemployment insurance claims against an employer over a 5-week period, for the Nation and States, by detailed industry; extended plant closings and layoffs lasting more than 30 days, by State and detailed characteristics of the layoff | Program began in 1984 at the direction of Congress. After the program was terminated in December 1992, Congress restored it in 1994. | Nationwide participation in the MLS program in 1994. A stand-alone PC-based operating system was provided to States in 1995. In 1996, the monthly news release on all layoffs, regardless of duration, was introduced. In 2000, a major program review involving BLS, the Employment and Training Administration (ETA), and the States was conducted. In 2004, the collection of data on job losses due to offshoring and outsourcing was initiated. |

| Exhibit 1. Continued—Statistical programs of the Bureau of Labor Statistics, 2009 | | | |
|--|--|---|---|
| BLS statistical program | Major outputs | Origins | Significant events in past 25 years |
| Multifactor Productivity (Industry and Major Sector) | Annual measures for the private business sector and selected industries. These measures expand the list of inputs with which output is compared. | Multifactor productivity (MFP) measures for private business were first issued in 1983. This report went a step beyond labor productivity analysis by accounting for capital inputs as well as labor. | The first set of manufacturing MFP measures comparing “sectoral output” (instead of real value added) with inputs of capital (C), labor, (L) energy (E), non-energy materials (M), and business services (all together KLEMS) was published in 1987. Estimates of the effects of the education and experience of the work force on private business productivity were issued in 1993. A set of KLEMS MFP measures for nonmanufacturing industries was prepared and used to critique the quality of available real output measures in 1999. A comprehensive set of MFP measures for detailed manufacturing industries was introduced in 2000. |
| National Compensation Survey (NCS), including the Employment Cost Index (ECI) | Quarterly rates of change in employer costs for wages and benefits; quarterly employer costs for wages and benefits; annual national, regional, and locality pay data by occupation; annual data on the incidence and characteristics of employee benefits | Studies of occupational wages in specific industries were among the earliest studies conducted by the BLS; ad hoc studies of employee benefits and workplace practices were also conducted periodically. After World War II, the need for occupational wage data by locality and industry was recognized; first sample of localities used to represent all metropolitan areas was introduced in 1960. Studies of wage and benefit costs date to the late 1950s; the current Employment Cost Index was introduced in 1976. The current benefits program began in 1979. | Separate Employment Cost Index (ECI), occupational wage, and employee benefit programs were combined in the mid-1990s to create the National Compensation Survey, which uses a single sample, collection process, and estimation methodology for all outputs. In 2009, the first locality ECI estimates were published for 14 large metropolitan areas. Annual wage and benefit cost levels were introduced in 1987; quarterly data were introduced in 2002. To meet the needs of the 1990 Federal Employees Pay Comparability Act, occupational wage data expanded from initial coverage for a fixed set of occupations to the current random selection from all occupations. Benefits data have expanded over time to the current coverage of all private industry and State and local governments. |
| National Longitudinal Survey (NLS) | Microdata from periodic interviews of a constant sample of people regarding working, education, and other life experiences Used by researchers in government and academia. | Began in the mid-1960s with four cohorts of individuals who were followed into the 2000s. | A new cohort of youths aged 12-16 years was started in 1997. More than 2,000 articles using NLS data have been written in scholarly journals in the last 25 years. |

Exhibit 1. Continued—Statistical programs of the Bureau of Labor Statistics, 2009

| BLS statistical program | Major outputs | Origins | Significant events in past 25 years |
|---|--|---|---|
| Occupational Employment Statistics (OES) | Annual occupational employment and wage data by geographical area or industry | Initial data collection efforts began in late 1960s and early 1970s; national industry-specific occupational employment estimates published since late 1980s; wage and geographical area data since late 1990s. | National industry-specific occupational employment estimates developed in late 1980s, with each industry available once every 3 years; in late 1990s, program expanded to include wage information, to cover all industries in each year, and to produce national, State, and local area cross-industry data. |
| Producer Price Index (PPI) | Family of indexes that measure average change over time in selling prices received by domestic producers of goods and services | Began in 1902 as Wholesale Price Index and is oldest continuous statistical series published by BLS. Comprehensive overhaul in 1978 resulted in restructured Producer Price Indexes. | Major expansion in coverage of services (from less than 1 percent of services GDP in 1985 to more than 77 percent now); added indexes for several types of nonresidential building construction in 2002–08; conversion to use of broadcast fax for mail surveys beginning in late 1990s. |
| Quarterly Census of Employment and Wages (QCEW) | Monthly employment and quarterly wages by detailed industry and geography down to the county level | Economic and statistical responsibility for the QCEW program (formerly known as ES-202) was transferred to BLS from the Employment and Training Administration (ETA) in 1972. Full funding and administrative responsibility were transferred to BLS in 1984. | Worksite- and establishment-level reporting was instituted in 1991–92. The program began to geocode data at the establishment level in 2003. The data review and publication process was accelerated by 3 weeks in 2005. |
| Survey of Occupational Injuries and Illnesses (SOII) | Annual counts and rates of workplace injuries and illnesses | Periodic data collection since 1910s; annual survey began in 1973. | Several external reviews in late 1980s; significant program revisions in early 1990s added demographics of injured workers and characteristics of incident; recent addition of rates by occupation and demographics. |

about 80 percent of the \$766 median for their male counterparts. This ratio has grown since 1979...when women earned about 62 percent as much as men. . . . Readers should note that the comparisons of earnings in this report are on a broad level and do not control for many factors that can be significant in explaining earnings differences.⁶

Because the statements that the BLS makes about its data are limited to fact-based descriptions and analysis, journalists and commentators often go elsewhere to obtain policy and political reactions.

Protecting confidentiality; reducing burden

Carroll D. Wright, the first Commissioner of Labor Statistics, defined the principles that are followed by the BLS to this day. Among those principles were “firsthand data collection, voluntary reporting and confidentiality of returns.”⁷ Although the methods of data collection have changed dramatically, the principles of voluntary reporting and confidentiality continue to be the focus for all BLS data collection activities.⁸

The BLS and its regional offices, State agencies, and contractors collect a wide range of data from employ-

ers—data on employment, wages, compensation, prices, and workplace safety and health—for input into two dozen surveys and programs. In general, the BLS and its partners enjoy good relationships with employers and obtain data from a large proportion of those surveyed. Still, the relationship between the BLS and survey respondents has changed considerably over the past 25 years, and the Agency has had to take a number of steps to maintain and improve the way it interacts with employers.

One of the biggest changes has been an explosion of new technology, particularly in the area of communications. Today, data requested by the BLS often are available electronically, reducing the employer's burden of compiling data. Along with this expansion of electronic records, however, comes heightened concern about security. Although the BLS has always pledged that employers' data would remain confidential and would be used for statistical purposes and only in the aggregate, the threat of inadvertent disclosure of the data adds to the complexity of maintaining confidentiality.

A major milestone in the 125-year history of the BLS came in 2002 with the passage of the Confidential Information Protection and Statistical Efficiency Act (CIPSEA). This law provides statutory protection of data collected by a Federal Agency under a pledge of confidentiality for exclusively statistical purposes (a principle that is essential for gaining the cooperation of both employers and individuals). The law also allows the BLS, the Bureau of Economic Analysis, and the Census Bureau to enter into data-sharing agreements to promote statistical efficiency.⁹

In addition to exerting efforts to allay fears about data security and confidentiality, the BLS has undertaken many initiatives over the past quarter century to use technology and automation to make it easier for respondents to provide data. Often, the efforts focus on methods that work at the convenience of the employer. For example, rather than having to schedule a visit or call from a BLS representative at a particular time, employers frequently can provide information at their convenience. (See box, pages 11–12.)

The same individuals and organizations that provide data to BLS frequently are users of BLS data as well. To capitalize on these unique relationships, the BLS often uses a “corporate” strategy to coordinate the collection of data for multiple programs, thereby reducing the number of independent contacts with the employer. By understanding the full nature of the employer's data needs, the BLS can offer customized data products to meet those needs—these days frequently provided over the Internet.

Some BLS programs are administered in conjunction with the States. The relationship between BLS and the States has changed considerably over the past quarter century. Beginning in 1984, the BLS has been responsible for the administration of agreements with the States for both labor market information and safety and health statistics. The BLS has full responsibility for planning, managing, and funding all the Federal-State cooperative programs.

The Federal-State cooperative activities allow State governments to leverage their existing relationships with employers, which can assist in building cooperation. The BLS and State representatives also work together through the Workforce Information Council to improve State and local data.¹⁰ Through these efforts and others, the availability of State and local labor market data has greatly expanded over the past quarter century. For example, in recent years the Current Employment Statistics (CES) program has expanded the amount of seasonally adjusted payroll employment data to the point that such data are now available for all States and nearly all metropolitan areas. In the same vein, the Local Area Unemployment Statistics (LAUS) program provides monthly estimates of employment and unemployment for 7,300 areas, including States, counties, and cities.

Employers responding to BLS data requests are remarkably generous with their time. This high degree of voluntary cooperation stems from two sources: (1) the high level of professionalism of the data collection staff and (2) the great care the BLS takes to protect the confidentiality of the information that respondents furnish. These partnerships with employers have been instrumental in maintaining consistently high response rates as well as high-quality data.¹¹ To maintain close relationships with employers and partners within State governments, the BLS realigned its regional offices in 1999. The streamlined regional structure (moving from eight to six regional offices) provided greater flexibility for the BLS to meet the needs of respondents and data users.

Relevance to economic and social conditions

The Act establishing the BLS (originally called the Bureau of Labor) within the Department of the Interior was signed by President Chester A. Arthur on June 27, 1884, and mandated that the Commissioner “shall collect information upon the subject of labor, its relation to capital, the hours of labor, and the earnings of laboring men and women, and the means of promoting their material, social, intellectual, and moral prosperity.”¹²

Since its inception, the BLS has focused many of its

studies on current economic and social conditions. Early studies “were broadly conceived and directed at social issues such as marriage and divorce, temperance, and laboring women and children, but, with periodic economic depressions and a growing industrial labor force, the Bureau was called upon increasingly to deal with more strictly economic issues such as wages, hours of work, prices, and the cost of living.”¹³ These core economic topics—wages, employment, hours of work, and prices—along with worker productivity and safety, continue to represent the fundamental statistics produced by the BLS. But changing economic and social conditions have led to an expansion in the topics covered, such as employer-provided child-care, the price of cellular phone service, and the identification of green jobs. Even in just a 25-year period, there are many examples of modifications in BLS programs and outputs made in recognition of a changing world.

Classification systems. One method of providing consistent

data on a variety of topics is through the use of standard classification systems. To categorize data, the BLS utilizes several classification systems, some exclusively, others as a result of collaboration within the U.S. Government statistical community, and still others as a result of agreements with multiple countries.

Perhaps the most widely used of these systems among all BLS programs is the industry classification system, which has undergone radical changes over the past 25 years. Gone are separate categories for chewing-gum manufacturers (now part of nonchocolate confectionary manufacturing) and girdle manufacturers (now included among manufacturers of lingerie and nightwear); added are many new categories, often with a technological bent, such as satellite telecommunications. Standardization of industry classification in the United States began in the 1930s; early work soon became the Standard Industrial Classification (SIC) system. The SIC was updated sporadically over 60 years, before rapid changes in the types of

Interaction with data providers in an electronic age

New technology calls for the development, testing, and implementation of new methodologies. The explosion of the capabilities of microcomputers and other telecommunication features of the 1980s spawned experimentation and the large-scale implementation of new methods for collecting data for all BLS programs. The Current Employment Statistics (CES) program has been especially at the forefront of electronic collection efforts, driven in part by the rapid turnaround time needed between collection and publication of monthly payroll employment data. The CES program tested a number of alternative data capture methods, including touch-tone data entry and computer-assisted telephone interviewing. The first touch-tone data entry and voice recognition technologies were included in new methods that substantially increased response rates for CES data. An electronic data interchange collection center opened in Chicago in 1995 to handle electronic data submissions from large firms. Also, the CES program implemented the first Internet collection in an ongoing Federal survey in 1996. Indeed, what was once an all-mail collection is now practically all collected by a cost-effective array of telephone- and Internet-based methods. And this work continues to evolve with technology and the needs of respondents. The work has been copied, modified, and designed to meet the specific needs of many programs in the BLS and around the world.

The BLS Internet Data Collection Facility (IDCF) is a centralized resource currently available to all BLS programs for electronic data collection. The IDCF uses a standard interface and security protocol for users to enter the facility, so that respondents to multiple surveys will not need different logon IDs or passwords. Once in the system, respondents may see different collection methods or different entry screens, depending upon which survey they are completing; however, applications adhere to design standards that result in the same “look and feel.”

The IDCF contains two approaches to Internet data collection: standard and “lite.” Using the standard format, respondents may be able to see data from their establishment from a prior period and can then enter current-period data. Respondents can save incomplete information and return to complete their entry at a later date. Alternatively, the “lite” version, typically used for small amounts of data capture, has a simpler logon procedure and does not show previous-period data. Respondents must enter all of their data during one session, because data cannot be saved. The two versions were designed to meet different needs: greater security, availability of data from a previous period, and multiple logons for more complex requests (standard collection), compared with simple logon and entry for simpler requests (“lite” data collection). Both versions have been successful.

Like the CES program, the Survey of Occupational Inju-

Continued—Interaction with data providers in an electronic age

ries and Illnesses (SOII) has had considerable success in moving its sample of more than 200,000 establishments toward electronic collection. Depending upon an establishment's injury and illness experience, data entry can be quite extensive. In 2003, the survey began offering the Internet as an optional data collection mode; included with the lengthy paper survey form was a flyer describing how respondents could enter their data over the Internet. That year, about 10,000 establishments did so, and over the next 3 years Internet data collection grew, despite limited marketing, to 53,000 establishments in 2006. In an attempt to further encourage Internet collection, beginning in 2007 survey forms were eliminated from the mailing sent to some establishments. As a result, Internet collection ballooned: in 2008, almost 100,000 establishments used the Internet to enter data. Beginning in 2009, nearly all establishments receive a short mailing requesting that data be entered over the Internet.

One activity that has helped to test and improve the IDCF is the use of "eye-tracking" technology (see photo below) through the BLS cognitive laboratory. The technology can follow a subject's eyes as he or she looks at a computer screen and, in particular, at a Web site. Changes to data collection screens,

especially as regards where and how instructions are presented, were made on the basis of the results of eye-tracking tests.

The BLS also has attempted to expand the information available to respondents, to make it clear how important their continued cooperation is to all BLS programs. Over the past few years, several BLS programs have added Internet pages targeted specifically at respondents. These pages typically provide questions and answers about the survey, including answers such as how establishments are selected and BLS procedures for maintaining the confidentiality of respondent data; definitions of, and concepts having to do with, the data being collected; and how respondents (and all employers) can use the results of data collection. The BLS expanded upon these pages in 2006, testing a new respondent page with detailed instructions for completing survey forms. Finally, as part of the 2008 Internet redesign, BLS introduced a set of pages with information targeted at selected audiences, including a "Survey Respondents" page that explains the importance of individual establishment responses and highlights the confidentiality precautions that the Agency takes. (See photo below.) The page has links to respondent information for many surveys, some of which have been updated to expand upon earlier test pages for respondents.



domestic industries and increased globalization led the United States, Mexico, and Canada to work together to develop a standard classification across the three countries in 1997: the North American Industry Classification System (NAICS).¹⁴ Nearly every BLS program has some industry component, and all have converted to NAICS

over the past decade. The box on page 13 provides a brief description of several classification systems: industries, occupations, geographic areas, characteristics of worker injuries and illnesses, and expenditures. Each system has been updated over the past 25 years to keep pace with the ever-changing economy.

BLS classification systems

Much of the data captured and published by the Bureau of Labor Statistics is categorized by a variety of classification systems. What follows is a brief description of some of the major classification systems used for BLS data.

Industry: NAICS

Developed under a production-oriented conceptual framework in cooperation with Canada and Mexico, the North American Industry Classification System (NAICS) represents one of the most profound changes for statistical programs focusing on emerging economic activities. NAICS groups establishments into industries on the basis of the activity in which the establishments are primarily engaged. Establishments using similar raw-material inputs, similar capital equipment, and similar labor are classified into the same industry. In other words, establishments that do similar things in similar ways are classified together. (For more information on NAICS, which was introduced in 1997, see “North American Industry Classification System (NAICS) at BLS” (Bureau of Labor Statistics, May 13, 2009), on the Internet at www.bls.gov/bls/naics.htm, visited June 17, 2009.)

Occupation: SOC

The 2000 Standard Occupational Classification (SOC) system was developed in response to a growing need for a universal occupational classification system. Such a system allows government agencies and private industry to produce comparable data. Users of occupational data include government program managers, industrial and labor relations practitioners, students considering career training, jobseekers, vocational training schools, and employers wishing to set salary scales or locate a new plant. Used by Federal agencies collecting occupational data, SOC provides a means of comparing occupational data across agencies. Reflecting the current occupational structure in the United States, the SOC system is designed to cover all occupations in which work is performed for pay or profit. The 2000 SOC is the result of a cooperative effort on the part of all Federal Agencies that use occupational classification systems to maximize the usefulness of occupational information collected by the Federal Government. The BLS plays a leading role in occupational classification by chairing the SOC Policy Committee, which is currently developing revisions to the system that are to be implemented in 2010. (For more information on SOC, see “Standard Occupational Classification” (Bureau of Labor Statistics, no date), on the Internet at www.bls.gov/soc, visited June 17, 2009.)

Geography: statistical areas

The BLS produces certain data series by State and by smaller

geographic divisions, including metropolitan and micropolitan statistical areas. These areas are defined by the U.S. Office of Management and Budget and are revised following each decennial census. The general concept of a metropolitan or micropolitan statistical area is that of a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core. Currently defined metropolitan and micropolitan statistical areas are based on the application of 2000 standards to 2000 decennial census data. (For more information on definitions of geographic areas, see “Metropolitan and Micropolitan Statistical Areas” (U.S. Census Bureau, no date), on the Internet at www.census.gov/population/www/metroareas/aboutmetro.html, visited June 17, 2009.)

Workplace injuries and illnesses: OIICS

The Occupational Injury and Illness Classification System (OIICS) is the classification system that is used to code the case characteristics of injuries, illnesses, and fatalities in the BLS Survey of Occupational Injuries and Illnesses (SOII) and Census of Fatal Occupational Injuries (CFOI). Worker injuries, illnesses, and fatalities are classified by the following characteristics: nature of injury or illness, part of body affected, source (primary or secondary) of injury or illness, and event or exposure. For example, a nurse sprains (nature) her back (part of body) from overexertion in lifting (event) a health care patient (source). The OIICS was originally developed by the BLS in 1992; other organizations have adopted this coding structure for their own use. The most recent update of the OIICS was in 2007. (For more information on the characteristics of workplace injuries and illnesses, see *Injuries, Illnesses, and Fatalities: Occupational Injury and Illness Classification Manual* (Bureau of Labor Statistics, July 11, 2008), on the Internet at www.bls.gov/iif/oshoiics.htm, visited June 17, 2009.)

Expenditures on goods and services

The BLS Consumer Price Index (CPI) and Consumer Expenditure Survey (CE) classify goods and services purchased for consumption into several hundred categories, which are then aggregated and published by major group, such as food, housing, apparel, transportation, health care, and recreation. While the major groups are kept consistent over time, the classifications are updated as new or changed goods and services are identified. (The CE information booklet *Consumer Expenditure Surveys: Quarterly Interview Survey* (Bureau of Labor Statistics, Apr. 1, 2009), on the Internet at www.bls.gov/cex/current/i_infobook.pdf, visited June 17, 2009, provides more detail on the groupings of expenditures. The current CPI structure is discussed in Appendix 3 of the December 1996 issue of the *Monthly Labor Review*.)

Employment data. Within the BLS employment programs, a major redesign of the Current Population Survey (CPS)—the source of national unemployment data—was implemented in 1994. The primary objective of the redesign was to improve the quality of the data derived from the survey; this was done by introducing a new questionnaire and modernized data collection methods.¹⁵ The redesign had four main objectives:

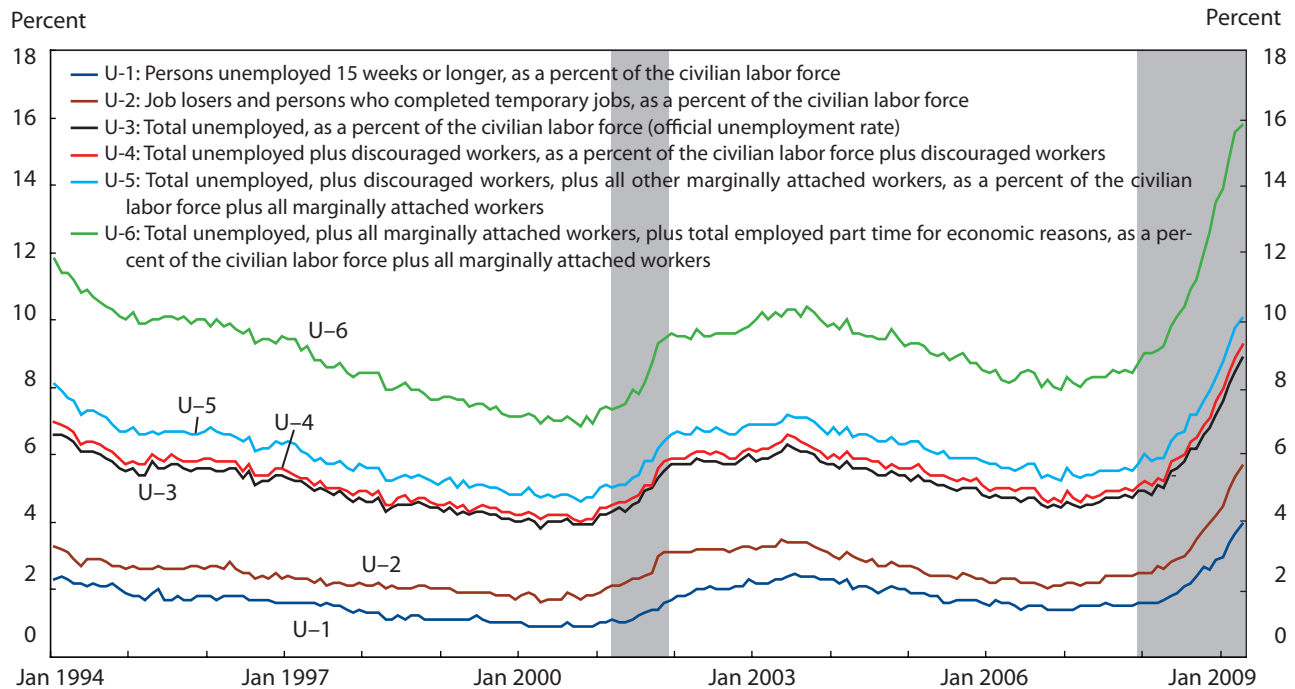
- to adopt a computer-assisted interviewing environment,
- to measure the official labor force concepts more precisely,
- to expand the amount of data available, and
- to implement several definitional changes.¹⁶

These changes led to the refinement of several alternative measures of unemployment that have been available for many years. Because of the redesign, the BLS now publishes six monthly measures of labor underutilization; these measures gain considerable attention especially during periods of rising unemployment.¹⁷ One such measure identifies those individuals who presently are working part time although they would prefer to work full time. Chart 1 shows the trend in each of the different measures of unemployment over the past several years.

In addition to refining its statistics, the BLS has expanded its employment statistics programs considerably over the past 25 years. Among surveys of households, the American Time Use Survey released its first-ever estimates in 2004 and the National Longitudinal Survey introduced a new survey of youth in 1997. Together, these programs provide a valuable look into the worklife and related economic and social activities of Americans, offering insight into work-family issues, changes in training requirements for the labor force, and the expansion of technology at work and at home. More recently, new data from the CPS on the employment status of individuals with disabilities were introduced in 2009.

From surveys of employers, the BLS added the Job Openings and Labor Turnover Survey and began publishing Business Establishment Dynamics data from the Quarterly Census of Employment and Wages. These programs help data users understand the underlying ebbs and flows in the labor market that might otherwise be masked by broader measures of employment and unemployment.¹⁸ In addition, the CES program was redesigned to improve statistical precision and broaden coverage to all workers, while the Occupational Employment Statistics program added to its publication of occupational staffing patterns

Chart 1. Alternative measures of labor underutilization, seasonally adjusted, 1994–2009



NOTE: Shaded areas represent recessions as determined by the National Bureau of Economic Research (NBER). NBER has not yet determined an endpoint for the recession that began in December 2007.

SOURCE: Bureau of Labor Statistics, Current Population Survey.

by including wages associated with those occupations. The Employment Projections program improved data on occupations and training requirements, while the Mass Lay-off Statistics program added data on job losses associated with offshoring and outsourcing.

Compensation data. The past quarter century has yielded a considerable number of changes in the type (and magnitude) of worker compensation; the BLS has made every attempt to track those changes. Employer costs for benefits have more than doubled from \$3.58 per hour worked in 1986 to \$7.98 per hour worked in 2008. As a percentage of total employer compensation costs, however, benefits in private industry have been relatively stable: 27 percent of compensation costs in 1986 and 29 percent in 2008.¹⁹ The benefits available have become more varied and more complex, and the responsibility for understanding and taking full advantage of benefit programs has shifted considerably from employers to employees. For example, in the early 1980s, traditional pension plans were quite prevalent; by 2008, such guaranteed plans had largely disappeared for private-sector workers. In their place are 401(k) and similar plans, often requiring workers to contribute in order to receive any contributions from their employer. The shift in retirement plans has had added complexities over the past 25 years, including the introduction of hybrid plans and employer activities that either canceled or froze existing plans. To provide data on each of these topics, the BLS has made numerous revisions to its benefits program in recent years.²⁰ Policymakers use BLS benefits data to determine the need for changes to social programs and tax structures, among other things.

Workplace health care benefits have changed as well. As the BLS celebrated its centennial in 1984, health insurance plans—often employer-paid “basic” benefits plus “major medical”—were just beginning to change. Health care inflation was high in the 1980s (see charts 2 and 3), one of several factors that may have led employers to begin a series of changes to the benefits they provide. Legislative changes also influenced what employers were offering.²¹ First came health maintenance organizations, then preferred provider organizations, followed by point-of-service plans, and, finally, consumer-driven health care.²² Employee premiums and employees’ share of total premiums grew, as did out-of-pocket expenses such as deductibles and copayments. One overarching theme of these changes has been the introduction of more choice and more responsibility for employees. Both of these features are evident in new arrangements such as medical savings plans and health reimbursement accounts. Benefits data

from the BLS National Compensation Survey have been expanded and redefined over time to keep up with these and other changes in employee benefits.

Beyond changes in retirement and health benefits, employees at the end of the first decade of the 2000s have access to such benefits as childcare assistance, parental leave, long-term care insurance, and financial counseling. Employers are establishing employee assistance and wellness programs to care for the well-being of their workforces. In addition, the traditional notion of the workday is no longer as rigid as it once was, with telework arrangements gaining considerable attention. The BLS reports on the percentage of workers who have these workplace options.

Price data. The BLS has produced data on prices and expenditures—consumer prices, producer prices, import and export prices, and consumer expenditures—for much of its history. Originally focused on the cost of living for U.S. workers, today’s data expand upon that concept to provide broader measures of inflation, price levels, and expenditure patterns. The CPI is used to adjust billions of dollars in Federal payments and programs, including annual adjustments to Social Security benefits and income tax brackets. Consumer Expenditure Survey (CE) data are used to adjust the standard sales tax amounts that can be deducted from Federal income taxes. CPI and Producer Price Index (PPI) data also are used as escalators in wage and price contracts, and PPI data are used as well to deflate a variety of economic time series, such as measures of inventories and sales, that are input into gross domestic product (GDP) calculations.

The wide use of BLS price measures and the large sums of money that are dependent upon such measures demand that they be precise and up to date. Several enhancements have occurred over the past quarter century to improve the accuracy of these data and maintain their relevance. In the CPI, expenditure weights, which are derived from patterns captured in the CE, are now updated every 2 years, rather than the less frequent updates that occurred prior to 2002. By updating the CPI market basket of goods and services used to construct the index, as well as the weights associated with those goods and services, the CPI improves its measurement of price changes for current U.S. consumers. For example, computing services represented 0.2 percent of the CPI market basket of goods and services in 1984; a quarter century later, such services have increased to 0.9 percent of the market basket—a fourfold increase reflecting their increased prevalence in the lives of Americans. The PPI has made significant progress toward its goal of expanding coverage of the U.S. economy. In 1985, only 1

percent of services, as measured by the GDP, was covered by the PPI; currently, 77 percent of services are included in the PPI, reflecting the growth in service industries in the Nation's economy. The PPI has been recognized for the development of innovative measures in health care and nonresidential buildings and specialty trades.

Other BLS data. Over the last 25 years, the BLS has improved the relevance of its productivity measures for the domestic economy in a number of ways: by improving consistency with the GDP National Accounts at the major sector and subsector level, by conducting research into factors affecting productivity, by expanding coverage of industry productivity, and by incorporating broader measures of multifactor productivity for industries as well as major sectors. As a result of improvements to the BLS productivity series and expanded visibility of these data, several countries, including Canada, Australia, and the European Union, have started producing multifactor productivity measures in the past few years, adopting approaches first used by the BLS.²³

The BLS international labor comparisons program began in the 1960s, with comparisons of unemployment and productivity for a few major industrial countries. In the

past 25 years, the program has maintained its relevance by expanding coverage of both indicators and countries. The main indicator added was international comparisons of manufacturing compensation costs, an important measure of competitiveness in tandem with productivity. With globalization, the needs of policymakers for comparative data on developing countries increased. The BLS met those needs by instituting studies of Mexico, China, India, and other countries that are of growing importance in international trade. In particular, the work on Mexico has been useful to those analyzing the labor market impact of the North American Free Trade Agreement.²⁴ The work on China and India has focused on hourly compensation and employment in manufacturing.

For some statistical measures, maintaining relevance comes from added detail. In the case of data on worker safety and health, the BLS changed its focus in the early 1990s in order to capture both the demographics of workers who are injured, taken ill, or killed and the circumstances that affected the individual. Today, not only are the available statistics on worker safety and health detailed and extensive, but some items added over the past quarter century highlight a variety of current workplace safety concerns:

Chart 2. Employment Cost Index, 12-month change, private industry, cost of total benefits and cost of health benefits, 1982–2009

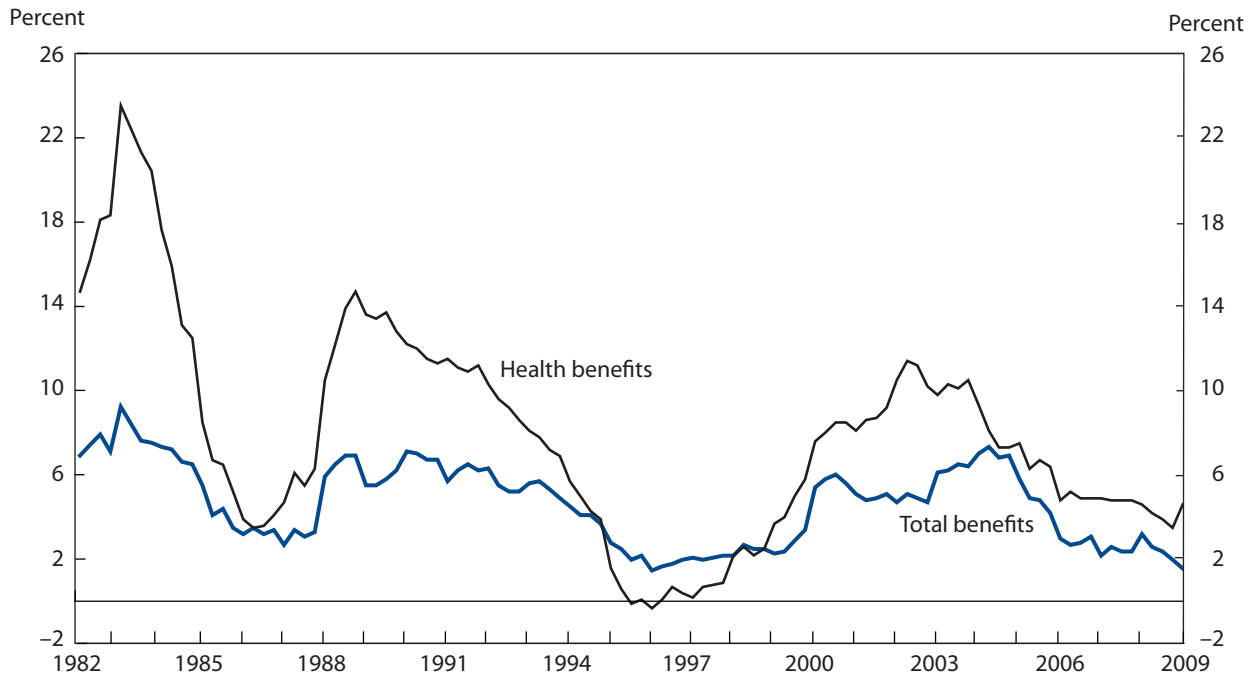
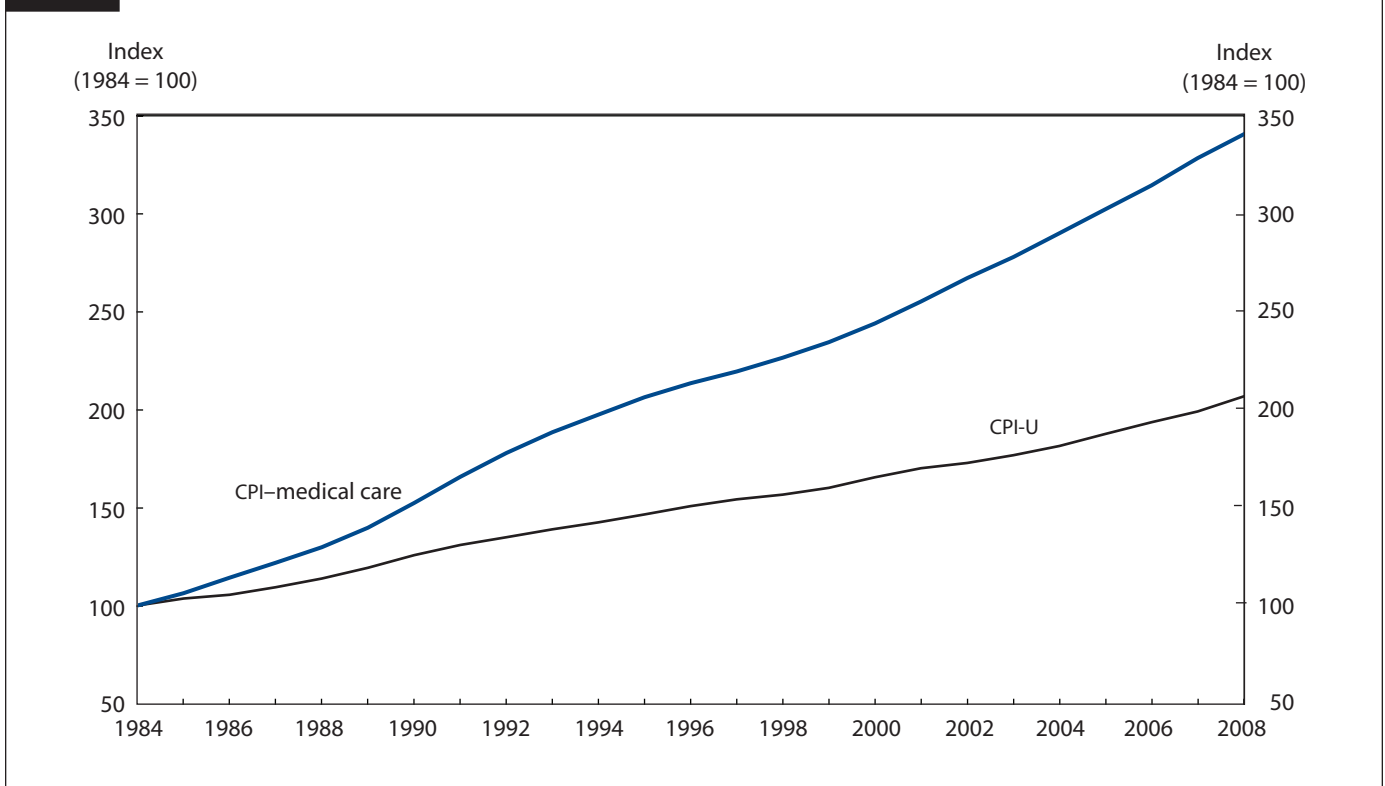


Chart 3. Growth in CPI-U and CPI-medical care, 1984–2008, not seasonally adjusted



- Identification of workers with musculoskeletal disorders;
- Identification of categories of perpetrators in workplace homicide cases, including family members, customers or clients, and robbers;
- Identification of the time of the incident and the length of time the employee had been at work when a workplace injury occurred;
- Identification of fatally injured Hispanic workers as either native or foreign born.

Reacting to unique circumstances. Although the BLS attempts to keep track of changes to the economy and seeks to anticipate the need to refine its programs, unforeseen circumstances can occur that require quick reaction. Two examples over the past quarter century are the terrorist attacks in September 2001 and Hurricane Katrina in August 2005. Both events stressed the BLS systems for capturing current and accurate data; both also resulted in the release of new or different outputs to reflect the specific economic condition. To ensure that statistics were reported accurately and completely, the BLS quickly introduced new procedures

and collection methods for identifying the operational status of businesses while minimizing disruption to respondents.

The 2001 terrorist attacks led to the special publication of workplace fatality data on individuals who were in “work status” when they were killed in the attacks. Among those included were office workers at the World Trade Center and the Pentagon, business travelers on each of the airplanes that were hijacked, and rescue workers killed in their attempt to save victims. Of the workers who were fatally injured as a result of the terrorist attacks, 80 percent were working in an office building, 14 percent were involved in rescue efforts, and the remainder were airline passengers.²⁵

Soon after Hurricane Katrina hit, the monthly CES program modified its procedures in recognition of the fact that many employers in heavily affected areas were likely to be temporarily or permanently out of business. Further, the BLS provided estimates of the effect of the hurricane on national payroll employment: the loss of 35,000 jobs in September 2005 was in stark contrast to the average monthly gain of 194,000 over the previous 12 months.²⁶ Finally, special questions were added to the CPS to identify individuals displaced by the hurricane.

The BLS released new Internet pages that showed the number of employees and business establishments in the counties that had been declared a disaster area following Hurricane Katrina. This feature of the Internet site was one of the first examples of “quick response” capabilities that the BLS has built; other examples have included special information on workplace fatalities related to mine cave-ins and crane collapses, employment effects of floods and hurricanes, and information on employment trends in finance, automotive, and other industries in the news.

Improved accuracy and timeliness

There are many examples of successful, ongoing efforts to improve the accuracy of BLS outputs. What these efforts frequently have in common is both the input of staff from many different disciplines to develop the best possible product and the advice of data users and other external experts. The BLS employs economists, statisticians, information technology specialists, behavioral scientists, program analysts, financial management specialists, and practitioners of many other disciplines; the Agency is organized by subject (employment, prices, compensation, and productivity), but also by areas of expertise (technology, data collection, publications, statistical methods, and administration). Professionals from each of these disciplines work together to build consensus around the best possible products.

High-quality methodology and research at the BLS flow from sustained and carefully focused long-term investments. An example of such an investment comes from 1988, when Commissioner Janet Norwood secured funding for laboratory-based research to improve survey measurement, leading to the integration of behavioral science theories and methods within the statistical sciences. Early work in the behavioral science research laboratory, also known as the cognitive laboratory, used the theories and methods of cognitive science to investigate accuracy, timeliness, and response burden by evaluating the effects of alternative wording and ordering of questions, variations in the design and structure of questionnaires, the mode of data collection on the quality of survey data, and the accuracy and timeliness of survey responses. BLS laboratory research has since expanded to all aspects of data collection, including interviewer training, computer-assisted interviewing technology, data processing, and areas outside of data collection, such as the dissemination of data and customer satisfaction. In another example, economic research units associated with each BLS program provide both expertise in program development and inde-

pendent research.

One example in which the cognitive laboratory has had a valuable and ongoing impact on BLS operations is its review of the BLS Internet Data Collection Facility, which supports Web-based data collection for several BLS programs. Since its inception and throughout several iterations, the facility has gone through cognitive usability testing, designed to identify how respondents will react to data collection screens and how best to design those screens to get the desired data from respondents. Recent tests have included high-technology eye-tracking software that follows a user’s eye as he or she reads an Internet screen and enters information. Such testing has optimized the user experience when reporting data and furthered the BLS mission of providing timely and accurate data.

In the area of statistical methods, the BLS also has invested in research activities designed to improve the accuracy and statistical soundness of various of its programs. Projects such as the conversion of the CES survey to a probability sample and improvements to seasonal adjustment techniques for many BLS programs come directly from this research. The Local Area Unemployment Statistics program, the first BLS program to use a model-based approach to estimation, incorporates regular updates to the modeling process.

Through both formal and informal means, the BLS reaches out beyond its borders to obtain input from many users. At present, the Agency has two formal advisory groups: the Federal Economic Statistics Advisory Committee (FESAC) and the Data Users Advisory Committee (DUAC). FESAC is a joint effort among the BLS, the Census Bureau, and the Bureau of Economic Analysis. FESAC members are generally from academic institutions and have backgrounds in economics, statistics, behavioral science, and related disciplines. The group meets with senior staff from the three statistical agencies; the agenda typically includes presentations on topics of interest across the agencies, such as inputs into the GDP accounts, statistical methods, and changes to industry or occupational classifications. The sessions include time for discussing ongoing research by the academicians, who often partner with Agency staff on projects of mutual interest. FESAC has been active since 1999, and the input of the various experts has led to improvements in the American Time Use Survey and in the PPI, among other BLS programs.

The DUAC is a recently formed advisory committee that replaces two longstanding committees: the Labor Research Advisory Committee (LRAC) and the Business Research Advisory Committee (BRAC). Both LRAC and

BRAC provided valuable input for nearly 60 years. The change in the advisory committee structure was designed to take the best aspects of those two groups and combine and expand participation to include a wide range of data users. DUAC's mission is as follows:

- To bring together data users from various sectors of the U.S. economy, including the labor, business, research, academic, and government communities;
- To engage in a dialogue on technical matters related to the collection, tabulation, and analysis of BLS statistics, on the Agency's published reports, on its data dissemination methods, and on the broader aspects of the overall BLS mission and function.

Other external inputs that help the BLS improve the accuracy of its statistics include formal and informal conversations with a wide variety of stakeholders. Many BLS programs that are administered in cooperation with the States have policy and advisory groups that provide a forum for State input into program operations and development. Field economists who collect data from employers often report on changes in economic conditions or new employer practices that might be ripe for future survey collection or tabulation. Individual programs participate in conferences and trade shows to encourage respondent participation in BLS surveys and to publicize BLS data. Through these interactions with stakeholders, the BLS gains valuable insight into the labor force and identifies potential improvements in survey programs.

Following delays in the implementation of a large-scale revision in the PPI, the BLS established several internal review processes. Programs identify "mission-critical projects" that are monitored more carefully by experts throughout the Agency. As a requirement of monitoring, large and highly visible projects must include detailed plans and written cross-organizational implementation strategies. These activities follow strict project management procedures to help ensure their success. In recent years, the BLS has developed several new measures under strict project management guidelines. Among these measures are employment cost indexes for 14 large metropolitan areas and rates of workplace injury and illness by occupation and demographic characteristics. The BLS continues to identify a half dozen or more mission-critical projects each year and has expanded its project management skills to help ensure the success of these projects.

More broadly, the BLS has implemented a rotating series of reviews of each of its statistical programs in order to pro-

vide multidisciplinary input to managers on program objectives and processes. These reviews focus on a number of aspects of a statistical program: what is being measured and what should be measured, proper planning, program operations, the use of information technology, program outputs and outreach efforts, and financial management. Although such reviews, which are being expanded to include input from external stakeholders, may not identify a large-scale problem that was unknown to program management, they have helped programs to develop long-run strategic plans that identify multiple improvements to be tackled over time. The inclusion of experts from various BLS programs and offices on the review teams helps to break down barriers and share best practices across the Agency.

Two aspects of the development of accurate estimates from statistical samples that are a constant challenge for the BLS (and, indeed, for any statistical organization) are variance and bias. *Variance* is a measure of the variability in estimates that can be attributed to random variability of the sampling and measurement process. Typically, the closer the sample size is to the size of the population, the lower is the variance. The BLS works to reduce variance by refining the sources of its samples, adjusting sampling sizes, and improving the allocation of the sample across certain variables, such as industry or geography. In recent years, these types of changes have resulted in lower variance estimates in a number of surveys.

Bias arises when the sample is not representative of the population being studied or when the data collection process results in systematic distortions. For example, if a large proportion of incomplete data in a particular survey came from one industry, the results of the survey might have a particular bias related to that industry. Similarly, if the misunderstanding of certain questions will lead to underreporting or overreporting of some expenditure, then the overall estimated mean expenditure may be biased. Improvements in sampling and estimation techniques, as well as in the data collection process, can help to reduce bias.

Over the past quarter century, BLS activities related to the measurement of variance and bias have included the following:

- Adding a measurement of statistical bias, as was done in the International Price Program;
- Increasing the quantity of published variance data, such as data on employee benefits;
- Conducting an analysis of nonresponse bias for the CES program;
- Implementing formal quality assurance processes, such as that for the Survey of Occupational Injuries

and illnesses;

- Standardizing collection processes and procedures, as was done in the Mass Layoff Statistics and Occupational Employment Statistics programs;
- Improving nonresponse follow-up procedures, such as call scheduling in the American Time Use Survey;
- Improving the design and wording of forms, as was done for the CES; and
- Computerizing the survey collection instrument, as was done for the CPS.

The rapid pace of technology change has allowed the BLS to implement numerous improvements in survey collection, processing, and dissemination techniques, among other things, but technological improvements have had some negative effects as well. Twice in the late 1990s, the BLS released key economic data on its Internet site ahead of the designated release time. These errors led to the implementation of strict human and technological procedures to guard against early release, including processes that involve the use of the Navy’s atomic clock to ensure accurate release times.

Improved collection and processing techniques (such as Internet collection and high-speed data processing) have resulted in more timely releases of data. In addition, the greatly expanded use of technology in data dissemination has helped transmit data to users more quickly. These improvements are most noticeable in the rapid adoption of the Internet for data dissemination. In January 1994, the BLS went live with an Internet presence—one of the first Federal Agencies to take advantage of this medium. Since that time, the Web has become the Agency’s primary and most heavily used data dissemination mechanism. (See box, pages 21–22.)

The BLS gathers customer feedback on its Web products and uses that feedback to improve public access to data. Such feedback was key to major Web site redesigns that occurred in 2001 and again in 2008, including multiple iterations of empirical usability testing involving representative end users (researchers, journalists, librarians, students, economic analysts, and others). In the process, the BLS incorporated lessons learned from ongoing site operation. The Agency’s current Web site highlights new content every business day and provides expanded search and query capabilities. Future plans include developing interactive graphics, including charts, maps, and other data visualizations, to make it easier to understand large data sets. Also under investigation are improved site and database search tools, more cross-program data compila-

tions, expanded subscription capabilities, and improved educational materials.

Insistence on transparency and candor

A BLS tradition that dates to the first annual report of Commissioner Carroll Wright in March 1886 is the inclusion of information about the methods employed in the development, collection, and tabulation of data.²⁷ Today, information on definitions, methodology, and limitations of the data can be found in tables and charts, as well as in technical notes that accompany most releases of data. The reason for such transparency is to make readers aware of the known limitations of the data, to guide them in the appropriate use of the information, and to assure them that proper statistical standards and techniques have been used. A comprehensive compilation of this technical material is available in the *BLS Handbook of Methods*. The *Handbook*, with chapters on each of the BLS programs, was published as a bound volume up until the end of the last century; it is now available online. One advantage of developing an online version of the *Handbook* is to allow more frequent updating. At present, each chapter is updated whenever methodologies change.²⁸

Among the types of information available to data users in the *Handbook* and elsewhere are response rates and variance estimates for survey data. Most BLS survey data are collected from employers, and most responses to requests for such data are voluntary. Although the response rate is often quite good, nonresponse can result in a decline in the quality of the data. The BLS publishes detailed statistics on response rates for its surveys. For example, the following tabulation indicates that the 2008 CPI included data from 84.5 percent of all items for which prices were sought, ranging from 53.6 percent of apparel prices to more than 91 percent of prices for food and beverages and for other goods and services:²⁹

| <i>CPI component</i> | <i>Response rate</i> |
|-----------------------------------|----------------------|
| Total | 84.5 |
| Food and beverages..... | 91.4 |
| Housing..... | 89.9 |
| Apparel..... | 53.6 |
| Transportation..... | 90.5 |
| Medical care..... | 75.9 |
| Recreation..... | 84.5 |
| Education and communication | 82.8 |
| Other goods and services..... | 91.7 |

Beyond the regular publication of information on methodology, BLS statistical programs are often the subject of external reviews, some initiated by the Agency it-

Development of the BLS Internet

The Internet has been the focus of much of the change that has occurred at the BLS in the last quarter century—and specifically, since the first BLS Internet site was launched in 1995. This initial foray onto the Web was inwardly focused, as pages were organized on the Internet in much the same way that BLS offices were organized. The first BLS Internet homepage was a grid of nine boxes (see photo below), and as users navigated beyond those boxes, they found the formal name of the Office that developed certain statistics. Users who were looking for data on workplace fatalities had to know that such data were produced in the Office of Compensation and Working Conditions. Select that box, and you might find the data you want; select another box, and you were lost.

As the data available on the BLS Web site accumulated, so did the Agency's interest in providing a better interface to help serve customers. That interface, which debuted in October 2001, attempted to organize data by topic, rather than by office. (See photo, next column.) As the Internet evolved, the new design presented some challenges for users. First, the theory behind the design was to provide users with a link from the homepage to anything they might want, so the page contained more than 100 links and could be overwhelming to the uninitiated. Second, the titles of the links often related to internal BLS program names or used other jargon, so getting where the user wanted to go still was nonintuitive.

But in some sense, problems with the interface no longer mattered, because users were not getting to BLS data by visiting www.bls.gov. Rather, the advent of the Internet search engine

meant that users were searching for their topic of interest; with luck, the search results provided a link to the appropriate BLS Internet page. For example, if you were to enter “workplace fatality statistics” into Google, the BLS homepage would appear as the third choice, although the first two choices would take you to the same BLS statistics on the Occupational Safety and Health Administration Web site.

The BLS changed its Internet homepage again in 2008, this time reducing the number of links on the page, adding fresh content up front each business day, and identifying resources that users might need. (See photo, next page.) The goal of the homepage has changed from providing a link to everything available from the Agency to providing highlights of the latest data available. The goal of the new homepage is to get users accustomed to coming back to it again and again for BLS information, rather than coming upon such information through a search engine or from a secondary source.

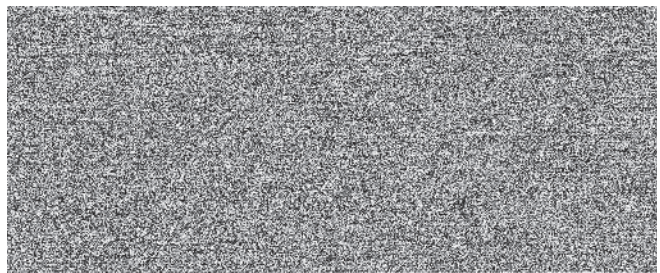
As the BLS Internet site has evolved, Web activity has expanded greatly. In 1995, the first year of its operation, the BLS Web site averaged 70,000 hits per month; in June 2008, the figure was 30 million hits. The pattern of use varies throughout the year and has remained consistent for many years. The heaviest usage is generally in the fall and spring, corresponding with the academic year. Usage typically declines during the summer. In addition, spikes in usage often coincide with the release of new data, such as the release of employment projection data every other November.

Finally, the BLS has begun to add material on its Internet

1995



2001



Continued—Development of the BLS Internet

site that focuses on broad economic themes, moving away from the program focus that has dominated the site since its inception. The new Web site includes spotlights on timely topics, such as older workers and African-American History Month, with data from a number of BLS programs. Special pages also are available that demonstrate how the BLS can

serve various constituents, such as jobseekers, investors, policymakers, journalists, and students. With fresh content now available on the homepage each business day, and with new features such as audio, video, so-called really simple syndication (RSS) Web feed format, and podcasts, more than ever do users have a single portal for labor statistics.

2008



self, others initiated externally. Over the past quarter century, standards for the operation of statistical surveys have evolved, and in 2006 the Federal Office of Management and Budget (OMB) updated and compiled those standards into a single volume.³⁰ Topics included in the standards are as follows:

- Development of concepts, methods, and design
- Collection of data
- Processing and editing of data
- Production of estimates and projections
- Data analysis
- Review procedures
- Dissemination of information products

Reviews of the survey process are a regular part of the business of producing government statistics. The OMB reviews all requests to collect statistical data; approval for such collection must be obtained periodically, at which time the OMB reviews each program for compliance with standards, as well as for relevance and potential duplication with other Federal data collection efforts. Certain major statistical programs receive an additional periodic

review from the OMB to ensure sound statistical practices. Reviews also are performed from time to time by the Government Accountability Office and the Department of Labor's Office of Inspector General; not infrequently, these topic-based reviews result in recommendations to improve survey processes.

Although many reviews of BLS programs result in recommendations for improvement, some reviews conducted by the aforementioned organizations and others receive considerable public attention or recommend sweeping changes. A few examples from the past quarter century illustrate the breadth of these inquiries and the effect they can have on the data being produced.

In one example, as a result of the Occupational Safety and Health Act of 1970 the BLS developed an ongoing program to capture and report data on workplace injuries, illnesses, and fatalities. This data collection effort concentrated on broad estimates of the number and rate of workplace injuries, but included little detailed information (such as the occupation or demographics of injured workers or details of the injury). Further, a sample survey was used to capture information on workplace fatalities, an effort that proved inadequate for the collection of rare

events. Criticism of the BLS occupational safety and health statistics in the mid-1980s led the Agency to request the National Academy of Sciences to convene an expert panel to review data on workplace safety and health. The panel's exhaustive study resulted in recommendations for major changes to the program, including the collection of data on the characteristics of injured workers and on the circumstances surrounding their injuries, as well as the introduction of a census format to capture all fatal work injuries. The BLS implemented these changes in the early 1990s.³¹

In another, perhaps more well known example, the work of the U.S. Advisory Commission to Study the Consumer Price Index (known more commonly as the Boskin Commission), which took place in the mid-1990s, confirmed internal BLS research that had identified issues with the index that were thought to result in overestimates of price increases, which in turn led to increases in the cost of Social Security, among other things. The BLS responded to these issues not only by introducing a number of changes to the CPI over the last decade, but also by publishing a number of reports on progress toward the implementation and on the effect of the changes.³²

Even without the impetus of outside reviews, the BLS strives to address questions and concerns about its statistics and implement changes where warranted. A few current examples demonstrate how the BLS has acknowledged criticisms of its data and provided clarification. In the area of employment statistics, data users have expressed concerns about differences between two surveys that provide similar information. The CES survey is a survey of employers that reports on the number of employees on the employers' payrolls each month. The CPS is a survey of households that reports on the number of individuals holding jobs, as well as the number and rate of unemployed persons. The employment levels reported by the CES and the CPS can differ, as can the direction and magnitude of the change in employment from month to month. The simple reason for such apparent discrepancies is that the surveys are measuring two different things: jobs and workers, respectively. Differences between the two kinds of estimate can result from individuals holding multiple jobs or from differences in the scope of the workers covered. The BLS provides considerable information to help data users understand this issue. For example, each monthly employment release includes a selection of frequently asked questions, the first of which relates to the different estimates provided by the two programs.³³

In another example, with increased attention to the monthly payroll employment data from the CES program,

the methodology used to account for newly formed businesses, known as the "birth-death model," has generated interest among data users. Again, the BLS has taken actions to help users understand the issue, providing considerable detail about the model on its Internet site and in publications.³⁴

Finally, the BLS recently published two articles designed to assist data users in understanding controversies that had arisen concerning certain BLS statistics. Such proactive acknowledgement of external criticisms is not new, but in a world of fast-paced information, the BLS is still learning how to address criticisms in a timely manner. A *Monthly Labor Review* article designed to identify and dispel myths about the CPI includes the following passage:

Within the past several years, commentary on the CPI...has not been concentrated in a single profession, academic discipline, or political group, but comes instead from an array of investment advisers, bloggers, magazine writers, and others in the popular press....This article is an attempt to correct some of the misunderstandings underlying those criticisms.³⁵

In the same issue of the *Review*, an article addressing allegations that the BLS undercounts workplace injuries and illnesses includes the following rejoinder:

The BLS Survey of Occupational Injuries and Illnesses (SOII or Survey) has come under criticism for undercounting the number of injury and illness incidents in the workplace....This article summarizes and critiques some of these studies and describes BLS efforts to better understand and address the undercount issue.

The Bureau of Labor Statistics...has instituted a number of activities to understand and, where possible, address the issue. First, in 2007 BLS conducted a quality assurance survey....Second, BLS is extending the scope of SOII to include all public-sector workers....Third, BLS has instituted a program of research....Fourth, BLS is undertaking focused interviews of employers to learn about decisions made to report injuries and illnesses on OSHA logs and to other data systems. Finally, BLS is exploring partnerships with other organizations, including the National Institute for Occupational Safety and Health, to research the use of alternative data sources to complement the data available from SOII.³⁶

The BLS is no stranger to controversy, and such criticisms are not unique to the last quarter century. Earlier controversies were similar in nature, expressing concerns about the accuracy of, and political influence on, statistics. What is different today is the rapid pace of news and the widespread nature of public commentary, often on the Internet. The BLS will continue to address these issues as they arise.

Looking forward

Since its centennial, the BLS has witnessed rapid growth in technology, a movement toward instantaneous news, the advent of online pundits with quick access to data, and a constantly changing economy that can be difficult to measure. Much of what the Agency measured as standard work

characteristics a quarter century ago is no longer standard, with such new phenomena as teleworking, medical savings accounts, employee leasing arrangements, green jobs, offshoring, and a host of others challenging the traditional means of measuring labor. The BLS has moved at different speeds to incorporate these phenomena into its programs and continues to develop new means of keeping abreast of changes in the labor environment and adapting its programs to those changes. The continued focus on its core principles—objectivity, confidentiality, relevance, accuracy, and transparency—and on its commitment to developing a staff grounded in a core set of disciplines, namely, economics, statistics, information technology, and behavioral science, has allowed the BLS to fulfill its mission to date. This focus will serve the Agency well as the characteristics of work continue to evolve in the 21st century. □

NOTES

¹ Janet L. Norwood, “Centennial,” *Monthly Labor Review*, January 1984, pp. 1–2.

² Joseph P. Goldberg and William T. Moye, *e First Hundred Years of the Bureau of Labor Statistics*, Bulletin 2235 (U.S. Department of Labor, September 1985).

³ Quoted from the BLS Mission Statement, on the Internet at www.bls.gov/bls/blsmisn.htm (visited June 17, 2009).

⁴ Founded in 1920, the NBER is a private, nonprofit, nonpartisan research organization dedicated to promoting a greater understanding of how the economy works. For more information, visit the NBER Internet site at www.nber.org (visited June 17, 2009).

⁵ See “Union Membership in 2008,” news release 09–0095 (Bureau of Labor Statistics, Jan. 28, 2009). For a further discussion of the problem of differentiating between the influence of unionization status and that of other worker characteristics on employee earnings, see Kay E. Anderson, Philip M. Doyle, and Albert E. Schwenk, “Measuring union-nonunion earnings differences,” *Monthly Labor Review*, June 1990, pp. 26–38.

⁶ See *Highlights of Women’s Earnings in 2007*, Report 1008 (Bureau of Labor Statistics, October 2008), p. 1.

⁷ Goldberg and Moye, *e First Hundred Years*, p. 12.

⁸ The only BLS data that Federal law (the Occupational Safety and Health Act of 1970) requires employers to provide are occupational safety and health statistics. Certain States require employers to provide some other BLS data.

⁹ For more information, see the Confidential Information Protection and Statistical Efficiency Act of 2002, Title V of Public Law 107–347.

¹⁰ More information on Workforce Information Councils may be found on the Internet at www.workforceinfocouncil.org (visited June 17, 2009).

¹¹ Some material from this section is based on information found in the *BLS Handbook of Methods*, on the Internet at www.bls.gov/opub/hom/home.htm (visited June 17, 2009).

¹² Goldberg and Moye, *e First Hundred Years*, p. 4.

¹³ *Ibid.*, p. 21.

¹⁴ NAICS has been updated twice since it was first released; the most recent version dates from 2007. For more information, see “North American Industry Classification System (NAICS) at BLS” (Bureau of Labor Statistics, May 13, 2009), on the Internet at www.bls.gov/bls/naics.htm (visited June 17, 2009).

¹⁵ The CPS, a monthly survey of households conducted by the U.S. Census Bureau for the BLS, provides a comprehensive body of data on the labor force, employment, unemployment, and persons not in the labor force.

¹⁶ *BLS Handbook of Methods*, chapter 1, on the Internet at www.bls.gov/opub/hom/homch1_a.htm (visited June 17, 2009).

¹⁷ For more information on the variety of measures of unemployment, see John E. Bregger and Steven E. Haugen, “BLS introduces new range of alternative unemployment measures,” *Monthly Labor Review*, October 1995, pp. 19–26.

¹⁸ For more information on new measures of labor dynamics, see Zhi Boon, Charles M. Carson, R. Jason Faberman, and Randy E. Ilg, “Studying the labor market using BLS labor dynamics data,” *Monthly Labor Review*, February 2008, pp. 3–16.

¹⁹ Data are from the BLS Employer Costs for Employee Compensation series for private industry, March 1986 and December 2008. More information may be found on the Internet at www.bls.gov/ncs/ect (visited June 17, 2009).

²⁰ For more information on changes in retirement plans in recent years, see Stephanie L. Costo, “Trends in retirement plan coverage over the last decade,” *Monthly Labor Review*, February 2006, pp. 58–64.

²¹ Examples of Federal legislation related to employer health benefits include the Health Maintenance Organization Act of 1973 and the Mental Health Parity Act of 1996.

²² Definitions of the various types of health insurance plans are found in *National Compensation Survey: Employee Benefits in Private Industry in the United States, 2005*, Bulletin 2589 (Bureau of Labor Statistics, May 2007).

²³ Further information on the recent history of the BLS Office of Productivity and Technology's productivity program appears in Edwin R. Dean and Michael J. Harper, "The BLS Productivity Measurement Program," in Charles R. Hulten, Edwin R. Dean, and Michael J. Harper, *New Developments in Productivity Analysis* (Chicago, University of Chicago Press, 2001), pp. 55–84.

²⁴ For a historical review of the international comparisons program, see Patricia Capdevielle and Mark K. Sherwood, "International comparisons: providing comparable international labor statistics," *Monthly Labor Review*, June 2002, pp. 3–14; for information on China, see Erin Lett and Judith Banister, "China's manufacturing employment and compensation costs," *Monthly Labor Review*, April 2009, pp. 30–38. An article on India is forthcoming in the *Review*.

²⁵ Complete data on work-related fatalities from the terrorist attacks are available in *Fatal Workplace Injuries in 2001: A Collection of Data and Analysis*, Report 970 (Bureau of Labor Statistics, September 2003).

²⁶ These statistics were released in the BLS Commissioner's statement that appeared concurrently with the October 2005 "Employment Situation" release. For more information on the effects of Hurricane Katrina on the Current Employment Statistics program, see "BLS Information: Effects of Hurricane Katrina on BLS Employment and Unemployment Data Collection and Estimation" (Bureau of Labor Statistics, May 2, 2006), on the Internet at www.bls.gov/katrina/cpscesquestions.htm (visited June 17, 2009). The Commissioner's statement appears on the Internet at www.bls.gov/news.release/history/jec_10072005.txt (visited June 17, 2009).

²⁷ Goldberg and Moye, *e First Hundred Years*.

²⁸ Some material from this section is based on information found in the *Handbook*; see note 11 for the Web address of the publication.

²⁹ Information on response to requests for data on the Consumer Price

Index is available on the BLS Internet site at www.bls.gov/cpi/cpirr2008.pdf (visited June 17, 2009).

³⁰ For more information on standards and guidelines for statistical surveys, see "Statistical Programs and Standards" (Office of Management and Budget, various dates), on the Internet at www.whitehouse.gov/omb/inforeg/statpolicy.html (visited June 17, 2009).

³¹ See Earl S. Pollack and Deborah Kellerman Keimig, *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System* (Washington, DC, National Academy Press, 1987).

³² For information on the Boskin report and follow-up activities from the BLS, see David S. Johnson, Stephen B. Reed, and Kenneth J. Stewart, "Price measurement in the United States: a decade after the Boskin Report," *Monthly Labor Review*, May 2006, pp. 10–19.

³³ See "Frequently Asked Questions about Employment and Unemployment Estimates" in the monthly *Employment Situation* news release, on the Internet at www.bls.gov/news.release/empisit.toc.htm (visited June 17, 2009).

³⁴ For more information on the CES birth-death model, see "Monthly Employment Situation Report: Quick Guide to Methods and Measurement Issues" (Bureau of Labor Statistics, Aug. 8, 2008), on the Internet at www.bls.gov/bls/empisitquickguide.htm (visited June 17, 2009).

³⁵ John S. Greenlees and Robert B. McClelland, "Addressing misconceptions about the Consumer Price Index," *Monthly Labor Review*, August 2008, pp. 3–19.

³⁶ John W. Ruser, "Examining evidence on whether BLS undercounts workplace injuries and illnesses," *Monthly Labor Review*, August 2008, pp. 20–32.