Quarterly Census of Employment and Wages

The **Quarterly Census of Employment and Wages (QCEW)** is a quarterly count of employment and wages reported by employers. The QCEW covers more than 95 percent of U.S. jobs available at the county, Metropolitan Statistical Area (MSA), state, and national level, by detailed industry. The primary source for the QCEW is administrative data from state unemployment insurance (UI) programs. These data are supplemented by data from two Bureau of Labor Statistics (BLS) surveys: the Annual Refiling Survey and the Multiple Worksite Report. Before publication, BLS and state workforce agencies review and enhance the QCEW data, converting errors to correct values and confirming and annotating unusual movements.

Quick Facts: Quarterly Census of Employment and Wages	
Subject areas	Employment, Pay
Key measures	County employment County wages Number of establishments
How the data are obtained	Administrative records
Classification system	Industry
Periodicity of data availability	Annual, Monthly, Quarterly
Geographic detail	County, Metro area
Scope	Government, Private sector, State and local government
Key products	• County Employment and Wages news release • Employment and Wages Online Annual Averages • Employment and Wages Archives • QCEW Open Data Access
Program webpage	• www.bls.gov/cew

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Concepts

The Quarterly Census of Employment and Wages (QCEW) consists of a monthly count of employment, quarterly counts of wage levels and business establishments, and a count of workers' average weekly wages at multiple levels of geographic and industrial detail for use by academic researchers, local governments and other federal agencies, and the public in general. An establishment is commonly understood as a single economic unit, such as a farm, a mine, a factory, or a store, that produces goods or services. Establishments are typically at one physical location and engaged in one, or predominantly one, type of economic activity for which a single industrial classification may be applied. An establishment is in contrast to a firm, or a company, which is a business and may consist of one or more establishments, where each establishment may participate in a different predominant economic activity. The QCEW provides an employment benchmark and sample frames for other Bureau of Labor Statistics (BLS) programs, as well as a basis of estimation of the wage and salary component for the Bureau of Economic Analysis Personal Income statistic. Standard sources used by the QCEW program are the North American Industry Classification System (NAICS, which replaced the Standard Industrial Classification system in the fall of 2002 and was first used in the publication of 2001 QCEW data), for industry detail; Federal Information Processing Standards, for geographic area codes; and the Office of Management and Budget, for size classes.

The QCEW makes use of a number of key variables:

- *Establishment count.* Aggregation of establishments in a given geographic area, in a given industry, with a given ownership status (that is, private or public), or any combination of the three.
- *Employment.* Counts only filled jobs, whether full or part time, and temporary or permanent, by place of work. The quarterly reports include the establishment's monthly employment levels for the pay periods that include the 12th of the month.
- *Wages.* Total compensation paid, including bonuses, stock options, severance pay, profit distributions, the cash value of meals and lodging, tips and other gratuities, and, in some states, employer contributions to certain deferred compensation plans (such as 401(k) plans), during the calendar quarter, regardless of when the services were performed.
- *Establishment size.* Classification of an establishment on the basis of the number of employees reported.
- *Industry.* Classification applied to each establishment on the basis of its primary economic activity.
- *County.* The primary local geographic designation for an establishment. It is assigned based on physical location.
- *Township.* A secondary local geographic designation, used primarily in the New England states and New Jersey.
- *Geocode.* A set of longitudinal and latitudinal coordinates identifying the location of the establishment.

Establishments are asked to provide physical addresses for their business activities. The addresses are then converted into geocodes by the BLS Office of Technology and Survey Processing and are provided to the states to add to the data. The geocodes are entered into Geographic Information Software to create detailed maps of the locations of establishments and their economic and administrative attributes.

Scope and exclusions

Private-industry employment. QCEW monthly employment data represent the number of covered workers who worked during, or received pay for, the pay period that included the 12th day of the month. Covered private-industry employees include most corporate officials, all executives, all supervisory personnel, all professionals, all clerical workers, many farmworkers, all wage earners, all piece workers, and all part-time workers. Workers on paid sick leave, paid holiday, paid vacation, and the like are also covered. Workers on the payroll of more than one firm during the period are counted by each employer that is subject to UI, as long as those workers satisfy the preceding definition of employment. Workers are counted even though their wages may not be subject to UI tax in the latter months of the year. In this regard, the federal UI taxable wage base is the first $7,000 paid in wages to each employee during a calendar year. Thus, at whatever point in the year an employee reaches that accumulation of wages, he or she is no longer taxed in the months remaining.

Government employment. Employment at all federal agencies for any given month is based on the number of people who worked during, or received pay for, the pay period that included the 12th of the month. Employment data reported for federal civilian employees are a byproduct of the operations of state workforce agencies in administering the provisions of Title XV of the Social Security Act the UCFE program. Federal employment data are based reports of monthly employment and reports of quarterly wages, both submitted quarterly to state agencies. Reports are submitted for all federal installations with employees covered by the act, except for certain national security agencies, which are excluded for security reasons.

Besides excluding the aforementioned national security agencies, QCEW excludes proprietors, the unincorporated self-employed, unpaid family members, certain farm and domestic workers from having to report employment data, and railroad workers covered by the railroad unemployment insurance system. Excluded as well are workers who earned no wages during the entire applicable pay period because of work stoppages, temporary layoffs, illness, or unpaid vacations. Excluded from QCEW federal government employment are elected officials in the executive or legislative branch, members of the armed forces or the Commissioned Corps of the National Oceanic and Atmospheric Administration, individuals serving on a temporary basis in case of fire, storm, earthquake, or other similar emergency, and individuals employed under a Federal relief program to relieve them from unemployment. For a complete list of federal government exclusions, see Appendix A of the UCFE Instructions for Federal Agencies. Excluded from QCEW state and local government employment are elected officials, members of a legislative body or members of the judiciary, members of the state National Guard or Air National Guard, and employees serving on a temporary basis in case of fire, storm, snow, earthquake, flood or similar declared emergency. For a complete list of state and local governments excluded services, see the coverage section of the most recent Comparison of State UI Laws.

Wages. In most states, covered employers report total compensation paid during the calendar quarter, regardless of when the services were performed. A few state laws, however, specify that wages be reported for or be based on the period during which services are performed rather than the period during which compensation is paid. Under most state laws or regulations, wages include bonuses, stock options, severance pay, the cash value of meals and lodging, tips and other gratuities. In some states, wages also include employer contributions to certain deferred compensation plans, such as 401(k) plans.

Covered employers' contributions to old-age, survivors, and disability insurance; health insurance; UI; workers' compensation; and private pension and welfare funds are not reported as wages. Employee contributions for the same purposes, however, as well as money withheld for income taxes, union dues, and so forth, are reported, even though they are deducted from the worker's gross pay.

Comparisons of related data series

For any given quarter, BLS publishes three different establishment-based employment measures. Each of the three measures—the QCEW, Business Employment Dynamics (BED), and Current Employment Statistics (CES)—is based on QCEW establishment reports, which are an enhanced and corrected version of quarterly unemployment insurance (UI) employment reports. Each measure has a somewhat different universe of coverage, estimation procedure, and publication product.

Differences in coverage and estimation methods can result in somewhat different measures of employment change over time. It is important to understand program differences and the intended uses of the program products. Exhibit 1 presents important differences among the three BLS employment measures.

Exhibit 1. Characteristics of Quarterly Census of Employment and Wages (QCEW), Business Employment Dynamics (BED), and Current Employment Statistics (CES) employment measures

Characteristic	QCEW	BED	CES
See footnotes at end of table.			
Source	• Count of UI administrative records (submitted by 9.4 million establishments in 2014)	• Count of longitudinally linked UI administrative records (submitted by 7.6 million private sector employers in 2014)	• Sample survey (588,000 establishments in 2014)
Coverage	• Coverage for UI and Unemployment Compensation for Federal Employees (UCFE); coverage is required of all employers subject to state and federal UI laws	• UI coverage, excluding government, private households, and establishments with zero employment	Nonfarm wage and salary jobs:
			• Jobs covered by UI; excluded are agricultural jobs, jobs in private households, and jobs held by self-employed workers
			• Jobs not covered by UI, including railroad jobs, jobs in religious organizations, and other non-UI-covered jobs
Publication frequency	• Quarterly, 6 months after the end of each quarter	• Quarterly, 7 months after the end of each quarter	• Monthly, usually the first Friday of the next month
Use of UI file	• Directly summarizes and publishes each new quarter of UI data	• Links each new UI quarter to longitudinal database and directly summarizes gross job gains and losses	• Uses UI file as a sampling frame and to annually realign sample-based estimates to population counts (benchmarking)

Source: U.S. Bureau of Labor Statistics.

Exhibit 1. Characteristics of Quarterly Census of Employment and Wages (QCEW), Business Employment Dynamics (BED), and Current Employment Statistics (CES) employment measures

Characteristic	QCEW	BED	CES
Principal product	• A quarterly and annual universe count of establishments, employment, and wages at the county, MSA, state, and national level, by detailed industry	• Quarterly employer dynamics data on establishment openings, closings, expansions, and contractions, at the national level by NAICS supersector and size of firm, and at the state private sector total level • Future expansions to include data with greater industry detail and data at the county and MSA level	• Current monthly estimates of employment, hours, and earnings at the MSA, state, and national level, by industry
Principal uses	Provides	• Provides business cycle analysis: Analysis of employer dynamics underlying economic expansions and contractions	• Is a Principal Federal Economic Indicator
	• Detailed locality data	• Analysis of employment expansion and contraction by size of firm	• Serves as an official time series for employment change measures
	• Periodic universe counts for benchmarking sample survey estimates		• Provides input into other major economic indicators
	• A sample frame for BLS establishment surveys		
Program Websites	• www.bls.gov/cew/	• www.bls.gov/bdm/	• www.bls.gov/ces/

Source: U.S. Bureau of Labor Statistics.

Source: U.S. Bureau of Labor Statistics.

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Data Sources

QCEW microdata. For each state,[1] the microdata of the Quarterly Census of Employment and Wages (QCEW) are the basis for the QCEW report and are fundamentally a byproduct of the unemployment insurance (UI) accounting system in that state. The states receive a Quarterly Contributions Report (QCR) from all private sector employers, as well as from state and local governments covered under the UI program. Along with these accounting reports, employers provide funds for their contributions payable, which finance the UI benefits system in each state. Federal government employers provide statistical reports via the Report of Federal Employment and Wages; these reports contain only employment and wages data, for each employer's installations within each state. Normally, private sector employers submit one contribution report covering all of their economic activities conducted in a given state. For employers having only a single physical location or worksite in a state, and thus operating under a single assigned industry and geographic code, the data from the accounting file are sufficient for statistical purposes.

However, such data are inadequate for statistical purposes for employers with multiple establishments in a given state or for employers engaged in different industrial activities within a state. In these cases, the employer's QCR reflects only statewide employment and wages, so it is not disaggregated by establishment or worksite. Although this level of data is sufficient for many purposes of the UI program, more detailed information is required to create a sampling frame and to meet the needs of several ongoing federal–state statistical programs. The QCEW report contains employer name and address information and serves as a sampling frame for BLS establishment-based surveys.

Surveys. The QCEW conducts two surveys in addition to collecting administrative data. Approximately one-third of all private sector businesses with more than three employees are contacted annually by the Annual Refiling Survey (ARS), and establishments with multiple locations are given the Multiple Worksite Report (MWR). The ARS verifies and collects geographic and industry information about businesses, and the MWR collects employment and wage data about businesses in order to make geographic and industry estimates. Both surveys collect data via paper forms and electronically. Data collection via paper forms uses the services of a private contractor to handle various administrative aspects of the process. Electronic data collection is done through MWRWeb, ARSWeb (for single-establishment employers), NVMWeb (for multiple-establishment employers), and the Electronic Data Information (EDI) Center (for exceptionally large employers). There are three ARS forms: BLS 3023-NVS (for single-establishment employers), BLS 3023-NVM (for multiple-establishment employers), and BLS 3023-NCA (for employers with unclassified industry establishments—that is, establishments which are not assigned any NAICS Industry code). The ARS is designed to collect specific information concerning the employer's industrial activity, geographic location, business mailing address, and physical address. The information is used to ensure that each establishment is assigned to the correct industry and that each address geocodes the correct geographic location of the establishment. The ARS also asks employers to identify the locations of new worksites they have established in the state. If these employers meet QCEW program reporting criteria, then an MWR requesting information on employment and wages for each worksite each quarter is mailed to the employer. Thus, the ARS is also used to identify new potential MWR-eligible employers.

The MWR is collected on a quarterly basis from all eligible (that is, multiple-establishment) employers for data from the previous quarter. The ARS is conducted on a 3-year cycle, with approximately one-third of all business establishments sampled each year. During this cycle, BLS identifies which establishments have changed from one type of business to another and reclassifies them under a different NAICS code. For example, brew pub establishments can change from a pub establishment to an eating and drinking establishment, and because of this change, they are placed on a 3-year cycle. Establishments that are classified into certain NAICS industries and that traditionally do not change industries very often are put on a 6-year cycle. Cemeteries are an example of such establishments. Still other establishments are assigned NAICS code 999999 (unclassified). These establishment are unclassified because the state does not have enough data to categorize them definitively into a particular NAICS code. There are a number of reasons for having insufficient data. For one, when originally setting up the business, the establishment could have left out relevant details. Another possibility is that the state deemed the NAICS code assigned to be incorrect and tried to contact the establishment but did not receive a response. To reduce the number of unclassified establishments, the state surveys them annually.

Readers may find forms and information as follows:

- MWR forms at https://www.bls.gov/cew/mwrforms.htm
- General information on MWR at https://www.bls.gov/cew/cewmwr00.htm
- Information on reporting MWR data via the Web at https://www.bls.gov/cew/cewmwr05.htm
- ARS forms at https://www.bls.gov/respondents/ars/forms.htm
- Electronic Data Interchange (EDI) reporting at https://www.bls.gov/cew/cewmwr02.htm

Confidentiality. The Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA) safeguards the confidentiality of individually identifiable information acquired under a pledge of confidentiality for exclusively statistical purposes. CIPSEA limits access of such information to authorized individuals with a need to know and levies fines and penalties for any knowing and willful disclosure of individually identifiable information by any BLS officer, employee, or agent. BLS policy on the confidential nature of respondent identifiable information (RII) states, “RII acquired or maintained by the BLS for exclusively statistical purposes and under a pledge of confidentiality shall be treated in a manner that ensures the information will be used only for statistical purposes and will be accessible only to authorized individuals with a need-to-know.” This policy remains in effect; however, the extent of confidentiality maintained within each state varies in accordance with the laws of that state. Accordingly, the statement on the ARS and MWR forms make no promise of confidentiality. However, once the QCEW data are furnished to BLS and are in its possession, the data are considered confidential and are covered by CIPSEA. BLS considers the maintenance of the confidentiality of data collected under a pledge of confidentiality to be critical to QCEW program integrity.

Authorization and participation. The ARS and the MWR are authorized by federal law 29 U.S.C. 2. Although employer cooperation is not required by federal law, 25 states[2] have laws that mandate the completion of the ARS, and 27 states[3] have laws that mandate the completion of the MWR. To encourage respondents to report their information, states offering them a number of ways to submit their data. By thus allowing respondents several reporting options, states are able to relieve some of the burden from the respondents.

States are required to attain a 70-percent response rate to the ARS for the establishments they survey or an 80-percent response rate among employees in those establishments. The ARS website email “blast” prior to the first (hardcopy) mailing (to 2012 ARS Web respondents), an ARS one-page letter prior to the first mailing, followup mailings of the ARS and MWR forms and cover letters to nonrespondents to the first mailing, and ARSWeb and MWRWeb email solicitations to any nonrespondents whose email address is on file, as well as telephone contact of key nonrespondents, are used to increase response rates. State agencies use specific techniques for converting nonparticipants to participants and for partial collection. Another technique is to assign codes to establishments that fail to respond after extensive followup efforts. The codes assigned are NAICS codes based on (1) their distribution across other establishments with the same NAICS codes and (2) other characteristics. States may review system-assigned NAICS codes and may overlay them with codes they have assigned.

Quality control and validation. As data are collected through the ARS and MWR surveys, quality control procedures ensure that the information collected is accurate. These procedures include followup of all nonrespondents and validation of all edit failures, which are incorporated into the design of the QCEW. Edit failures occur when State systems kick back any discrepancy in the data and state staff must resolve or bypass the discrepancy manually before the data can be saved. The states and the BLS regional offices also receive both training in industry coding and procedural assistance in conducting the survey. Regional offices conduct yearly quality assurance reviews in each state that is under their jurisdiction. States and regional offices receive training specifically in areas of industry coding and survey procedures in order to promote consistency within the states. Consistency ensures that all states code industries in a similar manner. The procedural assistance that states and regional offices receive is in the area of how to administer the survey. Included are protocols for suggestions on how to increase response rates (for example, certain telephone guidelines may be issued regarding the most effective way to turn a refusal into compliance) and how to maintain quality assurance (how to deal with edit failures and why edit failures occur).

There is an auto check for respondents who complete the MWR online. If wages are too high or too low, or if employment has changed drastically from the previous month or quarter, then the system asks the respondents, in real time, the reason for the change. Other, similar auto checks are in place in the state systems when the respondent enters data. MWR respondents are unable to save the data unless the checks are overridden or amended.

Industries that are hard to measure or reach have specific protocols in place as well. Guidelines are given to states for the most effective ways to reach companies in such industries and, once contact is made, how to ask them for their information most effectively. For example, when companies are unable to be reached, looking at what they do on their website helps. However, when what the website says is unclear, another idea is to look at which positions the companies are recruiting for. This method usually helps with companies in scientific and engineering industries, because the position descriptions listed reveal what type of specific work the company does. There are many more ways of canvassing companies for information as well.

NOTES

1 Included in the QCEW microdata are data for U.S. territories and the District of Columbia. For simplicity, they are referred to as states in this document.

2 ARS-mandatory states are California, Colorado, Florida, Georgia, Hawaii, Iowa, Kansas, Louisiana, Maine, Maryland, Nebraska, Nevada, New Hampshire, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Puerto Rico, South Carolina (mandatory only for employers with more than 21 employees), Vermont, Virginia, U.S. Virgin Islands, and West Virginia.

3 MWR-mandatory states are Alabama, California, Colorado, Florida, Georgia, Iowa, Kansas, Louisiana, Maine, Maryland, Minnesota, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Puerto Rico, South Carolina, Vermont, Virginia, U.S. Virgin Islands, and West Virginia.

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Design

This section is based largely on the 2014 Office of Management and Budget (OMB) clearance of the Quarterly Census of Employment and Wages (QCEW) program. The program's universe of business establishments consists of those establishments which are respondents to the U.S. Bureau of Labor Statistics (BLS) in partnership with the 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands (a total of 53 entities). The original source of data is the Quarterly Contribution Reports (QCRs) submitted to State Workforce Agencies (SWAs) by employers subject to state and federal unemployment insurance (UI) laws. The QCEW data, which are compiled for each calendar quarter, provide a comprehensive business name-and-address file with employment and wage information by industry at the six-digit North American Industry Classification System (NAICS) level and at the national, state, Metropolitan Statistical Area, and county levels for employers subject to state UI laws. Similar data for federal government employees covered by the Unemployment Compensation for Federal Employees (UCFE) program also are included. The QCEW data serve as the sample frame for establishment surveys conducted by BLS and selected states. In addition, the QCEW has served as a sample frame for other U.S. government surveys. The BLS role in the QCEW program is to establish and enforce uniform methods and processes that yield consistent data quality for the multifaceted uses of the QCEW data. In this role, BLS takes in raw UI administrative data, seeks to understand the error components involved, and uses methods and processes to reduce error and yield a high-quality economic dataset and sample frame.

The sampling frame

The QCEW is a virtual census of nonagricultural establishments' employees and their wages. It also includes about 53 percent of the workers in agricultural industries. The BLS process for enhancing the quality of the data collected is completed by the state's workforce agency staff. The process includes, but is not limited to, training staff; collecting data efficiently from large multiple-establishment employers, achieved through Electronic Data Interchange (EDI); applying statistically valid procedures for editing data, estimating missing reports and data elements (imputation), addressing standardization, and linking records; and using standardized processing systems for quality control procedures for data review. (See "Calculation" section for details about estimation procedures and reliability of the data.)

After the data have been extensively reviewed at the state, regional, and national levels, BLS uses the resulting file as a business establishment sample frame. The data also are summarized to produce counts of establishments, employment, and wages for all counties; all Metropolitan Statistical Areas; each of the 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands; and the nation, for all levels of industrial aggregation.

As shown in table 1, the number of private business establishments (worksites) covered by the QCEW in 2014 was about 9.07 million and the covered employment was about 115.6 million. In addition, about 61,000 federal government, 68,000 state government, and 165,000 local government establishments are covered; private households are excluded, as is all agriculture except forestry. The total number of covered establishments was about 9.36 million and covered employment about 136.61 million. The QCEW series has broad economic significance in measuring labor trends and major industry developments, in time series analyses and industry

comparisons, and in special studies such as analyses of establishments, employment, and wages by size of establishment.

Sampling weight. The QCEW is a census of establishments, or worksites; hence, every unit is in the sample and represents itself only. That is, each unit has a sampling weight of 1.00 (absolute certainty).

Reliability

The QCEW is designed in such a way that it can identify industries by geographical location and link establishments by multiple worksites in order to produce firm-level data. The QCEW has a longitudinal database in which it can link data over time and capture business mergers and acquisitions. It can also link by UI number.

An inherent strength of the QCEW is its basis in mandatory UI reporting and the built-in potency of that system. For example, each initial claim for UI benefits includes a check ensuring that the employer exists and is contributing to the UI compensation fund. Based on a weekly survey of over 270,000 initial claims and more than 14 million claims in total, the system ensures complete coverage.

The QCEW data are censuses of establishments and therefore are not subject to sampling error. However, some other types of errors can occur, such as invalid county, industry, or ownership codes; data entry mistakes; and over- or underreporting of employment and wages. To control for these errors, BLS has put in place extensive quality control procedures. Among these procedures are (1) improving data collection methods, including EDI and especially for large multiple-establishment employers; (2) standardizing data-processing systems so that they include edits, imputation, record linkages (with standardization of addresses), and industrial classification coding; and (3) standardizing training of staff at state, regional, and national levels in reviewing data according to the guidelines provided by the QCEW program office and stated in official memorandums.[1] Any reports that are identified as suspect after completing these procedures are individually reviewed. Contact with respondents is frequently used to validate significant movements or to correct the data.

The two most important initiatives undertaken by BLS to enhance the quality of QCEW data are the establishment of the Multiple Worksites Report (MWR) and the establishment of the Annual Refiling Survey (ARS). Two separate OMB clearances are obtained for these surveys. The MWR is sent quarterly to multiple-establishment employers for the purpose of asking them to break out their consolidated reports to the establishment level. For example, the UI system requires some employers to provide data for all of their operations within a state; the MWR asks the employer to provide information on each establishment so that all records on the file can be at the establishment level, which is generally the sampling unit for most BLS surveys. The information improves the quality of local economic data by reporting the location and type of economic activity more accurately.

The ARS is conducted annually on about one-third of the establishments in the sampling frame, for the purpose of updating businesses' industrial classification, name, and reporting and physical location addresses. The establishments surveyed are selected randomly. State and regional staff are trained extensively in industrial classification coding. In addition, standardized systems are provided to the states and regions to process the data.

Methods for maximizing response rates

Because employers are required to file Quarterly Contributions Reports (QCRs) under state and federal UI laws, response rates for these documents are generally very high. Response rates are about 95 percent for employment (table 2) and about 96 percent (table 3) for wages (like filing of QCRs, reporting of wages is required by UI law). Response rates for total covered employment are about 97 percent (table 3), because nonresponse is mostly from small establishments.

The growth of EDI—the direct transfer of data from the firm to BLS—also provides a high level of response and stability. BLS currently collects more than 432,000 reports from nearly 250 large firms with about 12.2 million employees via EDI. Virtually all of these firms provide data that make up the final estimates.

New BLS initiatives

BLS has undertaken several new research initiatives in the control and measurement of nonsampling error. The 1991 Current Employment Statistics (CES) survey's benchmark employment estimate transmitted to the QCEW revealed a substantial nonsampling error problem caused by payroll-processing firms. The American Statistical Association formed a committee to review BLS procedures and issued a report in January 1994.[2] BLS has adopted most of the report's recommendations. BLS has also conducted a Response Analysis Survey (RAS) of payroll-processing firms.[3] The purpose of the survey was twofold: to identify practices that can affect the data collected by the CES survey and the QCEW (the benchmark source data) and to educate payroll processors on proper reporting procedures. In addition, BLS has conducted a RAS of CES and QCEW covered employment reporting.[4] The survey identified factors that affect both CES and QCEW reporting within the same firm. On the basis of these RAS studies, BLS has undertaken an extensive education program with CES respondents. The program includes highlighting correct reporting of problematic items on the CES report form and including special notices on correct reporting in the monthly advance notice fax message. A new RAS was conducted in 2008; a report details new findings of the survey.[5]

Table 1. Quarterly Census of Employment and Wages (QCEW) summary data for 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, 2014 annual averages

Description	Number of establishments (thousands)	Annual average employment (thousands)	Total annual wages (millions)
See footnotes at end of table.			
Total	9,361	136,614	$7,016,975
Total private	9,067	115,569	5,928,257
Agriculture, forestry, fishing, and hunting	100	1,231	37,691
Mining	36	842	85,987
Utilities	17	549	53,869
Construction	752	6,109	336,206
Manufacturing	338	12,157	765,567
Wholesale trade	621	5,816	413,183
Retail trade	1,040	15,344	441,016
Transportation and warehousing	230	4,391	213,889

Table 1. Quarterly Census of Employment and Wages (QCEW) summary data for 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, 2014 annual averages

Description	Number of establishments (thousands)	Annual average employment (thousands)	Total annual wages (millions)
Information	151	2,732	248,146
Finance and insurance	472	5,634	548,621
Real estate and rental and leasing	360	2,040	105,722
Professional, scientific, and technical services	1,115	8,348	721,188
Management of companies and enterprises	60	2,154	243,204
Administrative and support and waste management services	499	8,572	307,249
Educational services	108	2,669	124,317
Healthcare and social assistance	1,377	17,904	821,026
Arts, entertainment, and recreation	133	2,095	73,033
Accommodation and food services	660	12,532	234,048
Other services, except public administration	810	4,235	143,734
Unclassified	188	215	10,562
Federal government	61	2,730	206,897
State government	68	4,545	246,266
Local government	165	13,770	635,555

Note: Industries are categorized by North American Industry Classification System (NAICS) code.
Source: U.S. Bureau of Labor Statistics.

Table 2. Percentage of imputed establishments, total private, January 2001–June 2014

See footnotes at end of table.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	6.02	6.03	6.06	5.78	5.78	5.87	5.08	5.10	5.13	5.03	5.06	5.10
2002	5.57	5.58	5.58	5.11	5.11	5.18	4.99	4.99	5.04	4.71	4.75	4.79
2003	6.20	6.22	6.22	5.53	5.50	5.58	5.21	5.21	5.23	5.46	5.48	5.54
2004	5.93	5.93	5.93	5.78	5.75	5.88	5.43	5.42	5.55	5.28	5.30	5.40
2005	5.61	5.63	5.70	5.06	5.04	5.21	5.17	5.19	5.20	4.58	4.64	4.73
2006	5.91	5.93	5.96	4.87	4.83	4.93	4.82	4.91	4.95	4.37	4.48	4.52
2007	5.08	5.23	5.25	4.50	4.62	4.70	4.29	4.31	4.37	4.08	4.11	4.19
2008	5.28	5.25	5.31	4.12	4.10	4.24	4.12	4.11	4.18	3.75	3.80	3.92
2009	4.86	4.88	4.97	4.06	4.03	4.15	3.62	3.62	3.70	3.52	3.54	3.70
2010	4.71	4.73	4.75	4.03	4.03	4.24	4.14	4.15	4.39	3.65	3.69	3.86
2011	4.64	4.67	4.76	5.20	5.20	5.40	3.58	3.60	3.73	3.06	3.14	3.26
2012	3.90	3.90	3.96	3.89	3.88	4.02	3.50	3.50	3.64	3.88	3.91	4.02
2013	4.28	4.19	4.27	3.43	3.43	3.58	3.01	2.95	3.06	2.95	2.90	3.04
2014	4.11	4.04	4.12	4.07	4.00	4.14	…	…	…	…	…	…

Note: Data include total private establishments (excluding households) in 50 states and the District of Columbia. Data do not include Puerto Rico and U.S. Virgin Islands. Data for July–December 2014 were unavailable at the time of publication.

Source: U.S. Bureau of Labor Statistics.

Table 3. Percentage of imputed employment, total private, January 2001–June 2014

See footnotes at end of table.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2001	5.15	5.09	5.11	4.76	4.70	4.74	4.41	4.38	4.48	4.68	4.68	4.75
2002	4.41	4.42	4.38	4.16	4.13	4.24	4.49	4.45	4.47	4.26	4.20	4.23
2003	4.92	4.93	4.82	4.36	4.29	4.39	4.62	4.54	4.58	4.62	4.61	4.57
2004	4.52	4.42	4.35	4.70	4.59	4.77	5.07	5.02	5.24	4.54	4.49	4.49
2005	4.10	4.09	4.12	3.80	3.74	4.09	3.96	3.95	3.83	3.82	3.78	3.80
2006	3.77	3.74	3.75	3.14	3.04	3.06	3.30	3.31	3.28	3.23	3.28	3.28
2007	3.28	3.28	3.24	2.95	2.89	2.94	3.08	3.08	3.10	2.86	2.82	2.87
2008	3.07	2.97	3.00	2.60	2.52	2.68	2.69	2.58	2.68	2.49	2.44	2.57
2009	2.84	2.75	3.26	2.35	2.29	2.36	2.34	2.29	2.51	2.34	2.26	2.33
2010	2.84	2.80	2.78	2.31	2.25	2.43	2.70	2.67	3.09	2.42	2.44	2.56
2011	2.79	2.78	2.88	3.04	2.99	3.25	2.32	2.33	2.41	2.22	2.23	2.28
2012	2.50	2.41	2.45	2.37	2.31	2.45	2.31	2.18	2.29	2.70	2.52	2.63
2013	2.72	2.54	2.62	2.17	2.13	2.28	2.34	2.14	2.26	2.22	1.97	2.13
2014	2.46	2.31	2.37	2.26	2.18	2.27	…	…	…	…	…	…

Note: Data include total private establishments (excluding households) in 50 states and the District of Columbia. Data do not include Puerto Rico and U.S. Virgin Islands. Data for July–December 2014 were unavailable at the time of publication.
Source: U.S. Bureau of Labor Statistics.

Table 4. Percentage of imputed wages in the Quarterly Census of Employment and Wages (QCEW), by quarter and year, first quarter 2001–second quarter 2014

See footnotes at end of table.

Quarter and year	Total establishment count	Percentage imputed
First quarter 2001	7,533,242	4.21
Second quarter 2001	7,535,474	4.20
Third quarter 2001	7,566,812	2.97
Fourth quarter 2001	7,586,276	2.89
First quarter 2002	7,631,984	3.71
Second quarter 2002	7,649,629	3.19
Third quarter 2002	7,664,231	3.09
Fourth quarter 2002	7,685,069	2.90
First quarter 2003	7,707,204	4.46
Second quarter 2003	7,706,809	3.41
Third quarter 2003	7,743,683	3.13
Fourth quarter 2003	7,752,148	3.16
First quarter 2004	7,803,049	3.95
Second quarter 2004	7,823,101	3.76
Third quarter 2004	7,863,531	3.33
Fourth quarter 2004	7,913,376	3.33
First quarter 2005	7,968,390	3.82
Second quarter 2005	8,003,698	3.28
Third quarter 2005	8,059,913	3.30
Fourth quarter 2005	8,100,643	2.76

Table 4. Percentage of imputed wages in the Quarterly Census of Employment and Wages (QCEW), by quarter and year, first quarter 2001–second quarter 2014

Quarter and year	Total establishment count	Percentage imputed
First quarter 2006	8,172,857	4.02
Second quarter 2006	8,196,981	3.24
Third quarter 2006	8,245,992	3.15
Fourth quarter 2006	8,315,522	2.68
First quarter 2007	8,324,352	3.59
Second quarter 2007	8,341,021	3.12
Third quarter 2007	8,387,074	2.82
Fourth quarter 2007	8,419,513	2.58
First quarter 2008	8,449,855	3.69
Second quarter 2008	8,466,818	2.98
Third quarter 2008	8,487,339	2.87
Fourth quarter 2008	8,492,607	2.61
First quarter 2009	8,417,511	3.76
Second quarter 2009	8,375,322	2.90
Third quarter 2009	8,360,108	2.69
Fourth quarter 2009	8,363,041	2.49
First quarter 2010	8,311,829	3.49
Second quarter 2010	8,303,570	2.99
Third quarter 2010	8,317,390	2.75
Fourth quarter 2010	8,345,743	2.38
First quarter 2011	8,317,722	3.85
Second quarter 2011	8,315,303	4.25
Third quarter 2011	8,347,899	2.68
Fourth quarter 2011	8,379,571	2.02
First quarter 2012	8,392,646	3.00
Second quarter 2012	8,392,328	2.96
Third quarter 2012	8,437,774	2.67
Fourth quarter 2012	8,475,116	2.95
First quarter 2013	8,948,604	3.33
Second quarter 2013	9,004,895	2.69
Third quarter 2013	9,048,695	2.29
Fourth quarter 2013	9,052,010	2.46
First quarter 2014	9,045,602	3.46
Second quarter 2014	9,042,613	3.26

Source: U.S. Bureau of Labor Statistics.

Table 5. Revisions in published Quarterly Census of Employment and Wages (QCEW) data for March 2013, U.S. total, September 2013–September 2014

March 2013 (September 2013 release)	March 2013 (December 2013 release)	March 2013 (March 2014 release)	March 2013 (June 2014 release)	March 2013 (September 2014 release)	First revision	Second revision	Third revision	Fourth revision	Total revision since September 2013

See footnotes at end of table.

Table 5. Revisions in published Quarterly Census of Employment and Wages (QCEW) data for March 2013, U.S. total, September 2013–September 2014

March 2013 (September 2013 release)	March 2013 (December 2013 release)	March 2013 (March 2014 release)	March 2013 (June 2014 release)	March 2013 (September 2014 release)	First revision	Second revision	Third revision	Fourth revision	Total revision since September 2013
132,338,943	132,327,062	132,314,263	132,304,485	132,300,622	-11,881	-12,799	-9,778	-3,823	-38,281
	June 2013 (December 2013 Release)	**June 2013 (March 2014 Release)**	**June 2013(June 2014 Release)**	**June 2013 (September 2014 Release)**	**First revision**	**Second revision**	**Third revision**		**Revision since December 2013**
	135,093,963	135,116,548	135,109,624	135,101,731	22,585	-6,924	-7,893		7,768
		September 2013 (March 2014 release)	**September 2013 (June 2014 release)**	**September 2013 (September 2014 release)**	**First revision**	**Second revision**			**Revision since March 2014**
		134,957,493	135,022,674	135,015,597	65,181	-7,077			58,104
			December 2013 (June 2014 release)	**December 2013 (September 2014 release)**	**First revision**				
			136,129,407	136,171,103	41,696				

Source: U.S. Bureau of Labor Statistics.

Table 6. Percentage of revisions in published Quarterly Census of Employment and Wages (QCEW) data for March 2013, from original to next publication, December 2013–September 2014

Preliminary publication	March 13 (December 2013 Release)	June 13 (March 2014 Release)	September 13 (June 2014 Release)	December 13 (September 2014 Release)
See footnotes at end of table.				
Percentage of revision from preliminary published data	-0.009	0.0167	0.0483	0.0306

Note: Percentage for Mar-13 (December 2013 release) is negative because the revised value of the data was lower than the original published value; thus, the net change was negative.
Source: U.S. Bureau of Labor Statistics.

Table 7. Percentage of revision from original to final publication

Preliminary publication	March 13 (September 2014 release)	June 13 (September 2014 release)	September 13 (September 2014 release)	December 13 (September 2014 release)
See footnotes at end of table.				
Percentage of revision from preliminary published data	-0.0289	0.0058	0.0431	0.0306

Source: U.S. Bureau of Labor Statistics.

[1] Official memorandums to the states and regional staff about the QCEW program (U.S. Bureau of Labor Statistics, various dates), available upon request by contacting QCEW, https://www.bls.gov/cew/cewcont.htm.

[2] American Statistical Association Panel for the Bureau of Labor Statistics' Current Employment Statistics Survey, "A research agenda to guide and improve the Current Employment Statistics survey" (Alexandria, VA: American Statistical Association, January 1994), available upon request.
[3] Karen L. Goldenberg, Susan E. Moore, and Richard J. Rosen, "Commercial payroll software and the quality of employment data," *Proceedings of the Survey Research Methods Section, American Statistical Association, August 13–18, 1994* (Toronto: American Statistical Association, 1994), http://www.amstat.org/sections/SRMS/Proceedings/papers/1994_178.pdf.
[4] George S. Werking, Richard L. Clayton, and Richard J. Rosen, "Studying the causes of employment count differences reported in two BLS programs," *Proceedings of the Survey Research Methods Section, American Statistical Association, August 13–17, 1995* (Orlando, FL: American Statistical Association, 1995), http://www.amstat.org/sections/SRMS/Proceedings/papers/1995_137.pdf.
[5] Sally Anderson, Margaret Applebaum, Michele Eickman, Greg Erkens, Kristin Fairman, Jeffrey Groen, Steve Kroll, Chris Manning, and Polly Phipps, "Differences in seasonality between the CES and QCEW programs: results from the 2008 Response Analysis Survey" (U.S. Bureau of Labor Statistics, August 21, 2009), http://www.reginfo.gov/public/do/DownloadDocument?objectID=48010201.

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Calculation

Data from the Quarterly Census of Employment and Wages (QCEW) are aggregations of various kinds of business establishment data, including geographical, industry, ownership, and establishment size data. QCEW data are not estimates. On occasion, when business establishment data are of poor quality or missing entirely, they may be imputed. (See "Design" section for more information on imputation in QCEW data.) Proration is used to handle multiple-establishment employers for whom the top employment and wage levels are known but distribution at the establishment level is unknown.

Editing and validating data

QCEW data are validated at BLS during a preestablished data review period after the completion of data collection and editing conducted by state workforce agency staff. Edits reduce approximately 9.4 million records to a manageable level. Establishments with no change or a statistically insignificant change to their economic data are ignored. Economic data types include employment, wages, industry, and county. QCEW criteria for reviewing individual establishment records are based on over-the-year changes to employment or wage levels for the establishment relative to the total employment level of the county it is located in. Data are validated to keep the number of establishment records that require review at a reasonable level while ensuring that detailed, county-level aggregations remain accurate. Program analysts review only employment and wage changes that exceed the criteria. Any large-scale changes that the analysts find in economic data need to be verified or corrected by working with state workforce agency staff. One of several methods used to validate significant changes is to seek corroboration with total wage-record counts. Wage records, provided directly by the employer, can be used to confirm both current levels and year-ago levels. The availability of wage record counts varies from state to state. As necessary, state staff contact respondents to obtain corrected data.

Calculation procedure

The aggregated totals of employment and wages for each subdomain (e.g., industry, geography, and size) of the QCEW are simply the sum of the establishments belonging to that subdomain. Averages and other statistics for each subdomain are derived by performing the appropriate arithmetic functions.

As mentioned, the BLS role is to impose quality on the raw data. One of the processes for doing so involves editing the data and conducting validation checks. The basic monthly employment edit consists of a six-step statistical test that includes the use of multiple t-tests for month-to-month changes, over-the-year changes, and a 12-month variation in data; some tests are conducted on levels while others are conducted on rates of change.[1]

Imputation

Although BLS receives QCEW files from all 53 entities in a timely manner, the files contain estimates for late and missing respondents. Therefore, one step in the data process is to estimate the number of late respondents, the number of missing respondents (i.e., unit nonresponse) and of the number of missing data elements (i.e., item nonresponse). As shown in table 2, as of June 2014 about 4 percent of establishments failed to respond to the

QCEW in a timely manner and thus required imputation; the corresponding percentage for employment in that same month and year was about 2 percent, as shown in table 3. The nonresponse rate for wages was about 4 percent in the first quarter, 2014, as shown in table 4.

The current method of imputation applies, to the missing establishment, the change from a year earlier to the previous month's employment or quarterly wages in order to estimate the current month's employment or quarterly wages. That is, the current month's employment for a missing establishment is equal to the previous month's employment multiplied by its change from a year earlier; a similar procedure is applied to estimate total quarterly wages. A drawback to this procedure is that it uses the trend from a year earlier rather than the current trend.[2]

BLS has conducted extensive research on alternative imputation methods for both employment and wages. The findings of the research indicate that current trends exhibited by the reported data from similar cells should be applied to nonrespondents. BLS defines the procedure for doing so as the ratio method. According to this method, the ratio for a particular estimation cell is computed as the sum of a current month's reported employment divided by the sum of the previous month's reported employment. To impute the current month's employment for a nonrespondent, the ratio is then multiplied by the nonrespondent's previous month's employment. A similar procedure is applied to impute average quarterly wages. The ratio method of imputation will be implemented in the new QCEW processing system.[3]

Another data-processing step is to link the QCEW data across quarters for various purposes, including (1) editing and imputation; (2) separating establishments into new establishments (openings or births), continuous establishments (existing businesses), and out-of-business establishments (closings or deaths); and (3) performing longitudinal research.[4]

Changes in employment levels

While collecting data, analysts may see large increases or declines in employment levels within an establishment. These changes may be verified by identifying a predecessor or successor establishment, respectively. Any such change may be due to a number of factors, including a merger between companies, the acquisition of one company by another, improved reporting by a multiple-establishment employer, and a physical relocation of employees. Often, states contact the employer in question to verify the shifts in the data and get an explanation as to why they occurred.

QCEW program analysts may also seek to validate data by asking questions of the State Workforce Agency staff. The questions usually are about an unexpected or large change in the economic or administrative data of a specific establishment or group of establishments. The agency provides the analysts with edited unemployment insurance (UI) data and often has firsthand knowledge of the changes to the data.

Other changes in economic activity

Breaks in published data—sudden shifts in employment or wage levels at the macrolevel—can occur for a number of reasons. One major reason is a change in coding, due to either a physical relocation of an establishment, a change in primary economic activity, a change in industry definition, or the correction of a reporting error. Another

reason is a change in the reporting status of an establishment. Some businesses with multiple establishments incorrectly identify themselves as a single unit. Eventually, if they are able to provide a breakout of economic and administrative detail for all of their subunits, it turns out that many of these units are in different counties and may require different industry codes.

Adjustments and related changes

Both adjusted over-the-year growth rates for the third month of the quarter and average weekly wages are published in the QCEW County Employment and Wages quarterly news release. These growth rates are not published anywhere else. The over-the-year changes in employment and wages are adjusted to account for most of the administrative corrections made to the underlying establishment reports. Adjustments are made by modifying the previous-year levels used to calculate the over-the-year changes. Over-the-year percent changes are calculated with the use of an adjusted version of the final, unpublished quarterly data of the previous year as the base data. The unpublished previous-year levels do not match the unadjusted data maintained on the Bureau of Labor Statistics (BLS) website. Over-the-year changes based on data from the website or from data published in previous BLS news releases may differ substantially from the over-the-year changes presented in the QCEW news release.

Other administrative changes

The adjusted data used to calculate the over-the-year changes presented in the news release account for most of the administrative changes: those occurring when employers update the industry, location, or ownership information of their establishments. The most common administrative adjustments are the result of updated information about which particular county a given establishment is located in. Included in these adjustments are administrative changes involving the classification of establishments whose county was previously reported as unknown or simply “statewide” or whose industry was reported as unknown. The classification “statewide” is used primarily for multiple-establishment employers with locations in multiple counties. It appears on the accounts master record that aggregates all establishment data. The classification is sometimes used by establishments whose economic activity has no primary location. The classification “unknown” is used by a state that is unable to identify the physical location of an establishment. Beginning with the first quarter of 2008, adjusted data account for administrative changes caused by multiple-establishment employers that submit reports for each of their establishments rather than reporting as a single entity. Beginning with the second quarter of 2011, adjusted data account for selected large administrative changes in employment and wages. These new adjustments allow the QCEW to include county employment and wage growth rates in the news release that would otherwise not meet publication standards.

The adjusted data used to calculate the over-the-year changes presented in any County Employment and Wages news release are valid for comparisons between the starting and ending points (a 12-month period) used in that particular release. Comparisons may not be valid for any period other than the one featured in a release even if the changes were calculated by using adjusted data.

Confidentiality

Finally, in accordance with BLS policy, data reported under a promise of confidentiality are published in a way so as to protect the identifiable information of respondents. BLS withholds the publication of UI-covered employment and wage data for any industry level when necessary to protect the identity of employers. Totals at the industry level for the states and the nation include the undisclosed data suppressed within the detailed tables without revealing those data. QCEW confidentiality concepts and practices are largely based on the "Statistical Policy Working Paper 22"(PDF) developed by the Federal Committee on Statistical Methods.

NOTES

[1] The wage edit includes the use of an interquartile test developed by David Hoaglin, Boris Iglewicz, and John Tukey in "Performance of some resistant rules for outlier labeling," *Journal of the American Statistical Association*, December 1986, pp. 991–999, http://amstat.tandfonline.com/toc/uasa20/81/396. The edit conditions and formulas are described in "Appendix-F: Edit conditions and formulas," *QCEW Operating Manual* (U.S. Bureau of Labor Statistics, 2007), www.reginfo.gov/public/do/DownloadDocument?objectID=48010401.

[2] The imputation formulas used by BLS are described in Chapter 8, "Imputation of Missing and Delinquent Data," and Appendix J of the *QCEW Operating Manual* (U.S. Bureau of Labor Statistics, 2007).

[3] For details of the method, including various exceptions, see *ICR documents* (Office of Information and Regulatory Affairs, Office of Management and Budget, Executive Office of the President), http://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201406-1220-001.

[4] Details of the methodology are given in Ivan P. Fellegi and Alan B. Sunter, "A theory for record linkage," *Journal of the American Statistical Association*, 1969, vol. 64, no. 328, pp. 1183–1210; and Kenneth Robertson, Larry Huff, Gordon Mikkelson, Timothy Pivetz, and Alice Winkler, "Improvement in record linkage processes for the Bureau of Labor Statistics' Business Establishment List," in Wendy Alvey and Bettye Jamerson, eds., Record linkage techniques—1997: Proceedings of an International Workshop and Exposition, *March 20–21, 1997, Arlington, VA*. Washington, DC: Federal Committee on Statistical Methodology, Office of Management and Budget, 1997. (For more information on establishment linkage, births, and deaths, see "Business Employment Dynamics," *Handbook of Methods* (U.S. Bureau of Labor Statistics), https://www.bls.gov/opub/hom/bdm/home.htm.

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Presentation

This section provides some information on the ways Quarterly Census of Employment and Wages (QCEW) data are presented. It also provides more information on the users and uses of these data. Because the QCEW is a census, there are confidentiality protection requirements that are different from those which apply to BLS survey products. All QCEW products are evaluated for the presence of data that may provide sensitive information regarding employment and wages reported by a particular employer. BLS withholds QCEW data to the extent needed to protect the confidentiality of sensitive data. Details regarding the methods used to protect the data are not shared so that the protection will maintain its strength.

Reliability

The QCEW is designed in such a way that it can identify industries by geographical location and link establishments by multiple worksites in order to produce firm-level data. The QCEW has a longitudinal database in which it can link data over time and capture business mergers and acquisitions. It can also link by UI number.

An inherent strength of the QCEW is its basis in mandatory UI reporting and the built-in potency of that system. For example, each initial claim for UI benefits includes a check ensuring that the employer exists and is contributing to the UI compensation fund. Based on a weekly survey of more than 270,000 initial claims and more than 14 million claims in total, the system ensures complete coverage.

Publications

The Quarterly Census of Employment and Wages (QCEW) news release County Employment and Wages is published quarterly but lags the last month of the quarter by roughly 5 months. For example, first quarter, covering January, February, and March, is published in early September. Data presented in the County Employment and Wages release, which are adjusted, are not revised, unlike the fully released QCEW data, which are not adjusted. County Employment and Wages focuses on large counties in the United States (counties with an annual average employment level of 75,000 or greater) and their growth in employment and wages in the third month of the quarter and in average weekly wages (AWW) for the quarter. Growth rates are calculated on an over-the-year basis and are adjusted to mute the effects of noneconomic changes. A variety of charts, tables, and maps in the release highlight the counties with the 10 highest and 5 lowest rates of growth in employment and AWW. Another section of the release spotlights the 10 largest counties in the United States by annual average employment level. The release also includes three tables, one showing adjusted employment and wage growth for all counties with employment of 75,000 or greater, a second presenting adjusted employment and wage growth for the 10 largest counties by level of employment, and a third displaying adjusted employment and wage growth for every state.

The tables "Employment and Wages, Annual Averages" are published annually on the QCEW program's website the same day as the first-quarter news release is published for the next year (i.e., the 2013 Employment and Wages, Annual Averages is published the same day as the 2014 first-quarter County Employment and Wages news release.)

QCEW data are regularly updated after their initial release and are not considered final until the end of the first quarter of the next reference year. Once data are final, they are not edited. If errors are found in publications after particular data are released, a corrected version of the data is released along with a note on what was changed. Such notes can be found in the "QCEW Special Notices" section of the program web page.

QCEW program analysts have published a number of articles in BLS publications, such as the *Monthly Labor Review*[1] and Beyond the Numbers.[2] (Also, QCEW data are often used in the BLS Office of Publications daily graphics-oriented publication TED: The Economics Daily[3] State partners of the QCEW use the data to write features on local areas, to research industry-specific trends, and to promote economic activity happening in their state.)

The QCEW has the benefit of a large, dataset in the form of 9.4 million employer reports. Users can easily manipulate the dataset and create interesting, relevant, and useful data. This aspect, unique among BLS programs, gives users the opportunity to create interesting, relevant, and useful new datasets:

Hurricane maps and tables. QCEW establishment data were matched with data from geographic files of potential flood zones due to hurricanes. Matching was done for every state along the Atlantic and Gulf of Mexico coasts and for more than 150 counties within those states. Geographic information software flagged individual establishments as either in or not in flood zones, for a scale of increasing storm intensity. The establishments were then aggregated by flood zone, and maps and tables were created to illustrate which states and counties were at great economic risk due to hurricanes.

Nonprofit data. In accordance with unemployment insurance (UI) laws, some establishments are not required to contribute to UI, but rather reimburse the UI system when a claim is made. In most states, these "reimbursable" accounts are restricted to 501(c)3 nonprofit organizations. The QCEW flags establishments that are "reimbursables" on its records. These records were matched against Internal Revenue Service data for verification, then compiled to create a new dataset for private sector establishments, employment, and wages for the portion of the nonprofit sector made up of 501(c)3 organizations.

Foreign direct investment. As of the end of 2015, the QCEW and the BEA were in the early stages of developing improved measures of foreign direct investment. The intent of the measures is to identify the number of establishments, the level of employment, and the amount of wages that result from foreign direct investment.

To contact the QCEW program, visit the QCEW website.

Revisions

QCEW data for the first quarter of each year are published five times: the original data are first released in September of that year and are followed by revisions in December of the same year and in March, June, and September of the next year. For example, March 2013 data are first published in September 2013, and revisions of the March data are published in December 2013 and then in March, June, and September of 2014. Second-quarter data are published four times, third-quarter data three times, and fourth-quarter data twice.

Table 5 shows the path of data for March 2013 from their initial publication in September 2013 to their final publication in September 2014. The initial published value of March 2013 employment (132,338,943 jobs) is seen in the first column. In the same row in the four subsequent columns are the revised values of March 2013 employment in each of the subsequent four quarters. In the next four columns, the difference between the current published value and the value of the previous quarter's published value is shown. The final column shows the difference between the original published value and the final value published 1 year later. As shown in table 6, the largest revision generally occurs from initial publication to the first revision, as missing reports, including reports of business deaths,[4] come in from employers responding late.[5] The magnitude of the revisions is relatively small, less than 0.05 percentage point. Table 7 shows the percentage of revision from the original value to the final publication value.

Data available

QCEW data are available online via Open Data Access or the BLS Database. Preliminary data are published each quarter, with a lag of roughly 5 months after the third month of the publication quarter. All quarters are considered open for updates until the publication of first-quarter data for the next year. Data are available at the county, Metropolitan Statistical Area (MSA), state, and national level by industry, down to the six-digit level of detail for privately owned establishments as well as local, state, and federal government agencies.

Through its Open Data Access/QCEW Data Viewer feature, the QCEW program provides a collection of comma-separated values (CSV) files, designed to allow third-party programmers, developers, and organizations to retrieve published QCEW data in CSV format. The Open Data Access webpage provides links to QCEW CSV file documentation, as well as to sample code in several languages. QCEW CSV files are organized by industry, by area, and by establishment size class. An industry file contains all the records associated with the industry over a single period. An area file contains all the records associated with the area over a single period. A size file contains all records published within a specific size class for the first quarter of a specified year. All published QCEW data are provided by each set of files. The files contain precalculated location quotients, which are values that quantify how concentrated a particular industry is in a county or state compared with how concentrated that industry is in the nation. QCEW's Data Viewer interface uses these same CSV files to build custom HTML tables based on selected criteria.

Users and uses of QCEW data

QCEW data are used by various organizations for various purposes:

The Employment and Training Administration of the U.S. Department of Labor uses QCEW data as it oversees the UI program.

The Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce uses QCEW wage data for the wage and salary component of the personal income statistic.

The BLS Business Employment Dynamics program uses QCEW data to produce gross job gains and losses, as well as maintain the Longitudinal Database of QCEW records.

The BLS Current Employment statistics program uses QCEW data as a sample frame, as well as an annual benchmark.

The following BLS establishment surveys, censuses, and programs also use QCEW data as a sample frame:

Occupational Employment Statistics survey

Job Openings and Labor Turnover Survey

Current Population Survey

Survey of Occupational Injuries and Illnesses

Local Area Unemployment Statistics program.

NOTES

[1] See, for example, Jennifer Cruz, Peter W. Smith, and Sara Stanley, "The Marcellus Shale gas boom in Pennsylvania: employment and wage trends," February 2014, https://www.bls.gov/opub/mlr/2014/article/the-marcellus-shale-gas-boom-in-pennsylvania.htm.

[2] See, for example, Paul Ferree and Peter W. Smith, "Employment and wage changes in oil-producing counties in the Bakken Formation, 2007–2011," April 2013, https://www.bls.gov/opub/btn/volume-2/employment-wages-bakken-shale-region.htm.

[3] See, for example, "Average weekly wages among largest counties, third quarter 2014 to third quarter 2015," March 11, 2016, https://www.bls.gov/opub/ted/2016/average-weekly-wages-among-largest-counties-third-quarter-2014-to-third-quarter-2015.htm; "Sweets for the sweet: employment at gift-related retailers," February 12, 2016, https://www.bls.gov/opub/ted/2016/sweets-for-the-sweet-establishments-and-employment-of-gift-retailers.htm; and "Hurricane Katrina: a look back at employment and unemployment," August 25, 2015, https://www.bls.gov/opub/ted/2015/hurricane-katrina-a-look-back-at-employment-and-unemployment.htm.

[4] For a definition of "business deaths," see "Business Employment Dynamics: concepts," *Handbook of Methods* (U.S. Bureau of Labor Statistics, December 24, 2015), https://www.bls.gov/opub/hom/bdm/concepts.htm.

[5] Note that the percentage for the first release is negative because the revised value was lower than the previously published value.

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History

The Quarterly Census of Employment and Wages (QCEW) is an administrative dataset guided by unemployment insurance (UI) coverage laws.[1] These laws vary across states. They have evolved over time and continue to do so from state to state and year to year. The following time line presents important events in the history of the QCEW programs:

Year	Event
1938	The Federal Unemployment Tax Act (FUTA) becomes effective. Administered by U.S. Department of Labor (DOL) Manpower Administration.
1950	*Employment and Wages* is first issued as a semiannual report.
1972	The Bureau of Labor Statistics (BLS) assumes responsibility for publication of the now quarterly *Employment and Wages*.
1975	*Employment and Wages* becomes an annual publication.
1988–91	Business Establishment List Improvement project moves from data collection on a reporting unit basis to a worksite basis.
1989	States begin providing data to the Quarterly Census of Employment and Wages (QCEW) at the business establishment level.
1994–97	The Microdata/Macrodata (MIC/MAC) project creates a single file that combines the microdata and macrodata.
1995	The Electronic Data Interchange (EDI) Collection Center is established.
1997	The North American Industry Classification System (NAICS) is developed to replace the Standard Industrial Classification (SIC) system.
2002	QCEW data are published under NAICS 2002 codes.
2002	QCEW program begins publishing data quarterly.
2003	The Business Employment Dynamics (BED) program publishes first quarterly release using QCEW establishment data.
2003	BLS begins releasing fully detailed industry data at the county, Metropolitan Statistical Area (MSA), state, and national levels.
2007	QCEW data are published under revised NAICS 2007 codes.
2010	Last printed edition of *Employment and Wages, Annual Averages* is published.
2012	QCEW data are published under revised NAICS 2012 codes.
2014	QCEW data are made available publicly as an open data product.

The QCEW program was initially named Employment Security Report 202, after the form on which data were collected. In 1998, to give some context to what the program produced, the name was changed to Covered Employment and Wages (CEW). The program became known as the Quarterly Census of Employment and Wages in 2002, to describe the mission more accurately.

The Standard Industrial Classification system (SIC) was used by the QCEW program to code establishments by industry until the fall of 2002, when the North American Industry Classification System (NAICS) was utilized in the publication of 2001 data.

In the late 1970s and early 1980s, special extracts and aggregations were provided via mainframe computer tape and, later, on floppy disks. Alternatively, special print tables were produced with the information, as requested by customers. Data were subject to basic disclosure limitation procedures.

Following the early 1980s and into the late 1990s, a similar pattern occurred, but with more sophisticated disclosure limitation procedures. Some data requests were filled via CD, while more complicated requests required that BLS be reimbursed. During this timeframe, QCEW established subscription agreements with some of the larger private data companies. These companies would get updated files when they were available. Although data were scheduled to be released quarterly, they were actually released irregularly. On occasion, there were delays that pushed back file creation until more than one added quarter of data could be released at once.

From the late 1990s forward, requests that required reimbursement slowed and then ceased. More sophisticated disclosure limitation procedures were used. Early online tools offered annual average data for 1997 forward. In the early 2000s, a small number of downloadable files were posted on the BLS File Transfer Protocol site.

In 2014, QCEW data were made available as an open data product via comma-separated values (CSV) files on the program's web page. Open data, as described in OMB memorandum M-13-13 (PDF), refers to publicly available data structured in a way that enables the data to be fully discoverable and usable by end users. The CSV files are designed to allow third-party programmers, developers, and organizations to retrieve published QCEW data in CSV format. QCEW CSV files are organized by industry, by area, and by establishment size class.

Major projects

The QCEW program has undertaken several major projects in its brief history.

Business Establishment List. The Business Establishment List (BEL) Improvement project was initiated to obtain information on multiple-establishment employers on a quarterly basis. Under the project, the collection of data on employment and wages for multiple-establishment employers was changed from a reporting unit (county or industry total) basis to an individual worksite (establishment) basis. As part of this change, the size criterion used to define multiple-establishment employers was lowered to include smaller employers. As a result, both the number of establishments and the number of multiple-establishment employers increased. The State Statistical Supplement forms that were previously used to collect county and industry summary-level data on multiple-establishment employers were replaced by the Multiple Worksite Report (MWR), a standardized form for use in all states.

The project began in late 1988, using the Annual Refiling Survey (ARS). The survey obtained worksite identification information for existing multiple-establishment employers and identified those multiple-establishment employers which were previously categorized as single-unit employers. To capture ARS physical location address information for single-unit employers, the SIC Refiling Control System (SRCS) was modified in mid-1988 and the new version was provided to the states. The new, standardized MWR received OMB clearance and was mandated for state use beginning with data for the first quarter of 1991. (Note that, although state use of the form was mandatory, depending on state UI laws, it was not mandatory that all employers in the state use the form.) The MWR was intended to collect quarterly information on employment and wages from multiple-establishment employers.

MWR. The MWR was a major component of the BEL improvement project launched in 1989. The BEL moved the BLS sampling frame from a reporting-unit to an establishment basis. The Longitudinal Data Base was established and later became part of the popular Business Employment Dynamics (BED) program. As mentioned earlier, the MWR replaced State Statistical Supplement forms. Several states had already collected establishment-level data, and their forms served as a model for the MWR. The initial quarter during which MWR establishment-level data were collected was the first quarter of 1991. The MWR enabled the QCEW program to be the first in BLS to develop a standardized magnetic-media reporting format. The MWR was implemented in September 1992, 3 years prior to the opening of the Electronic Data Interchange (EDI) Collection Center in Chicago.

In 1995, BLS established the EDI Collection Center to improve and to expedite the MWR collection process. Employers who complete the MWR for multiple-location businesses submit information on employment and wages via an electronic medium directly to the collection center, instead of submitting separate forms or files to each individual state agency. The collection center then edits the employers' data and forwards the data to the appropriate state agency. The EDI Collection Center is geared toward firms that meet certain size thresholds.

Electronic and web-based filing has reduced costs considerably for large and midsized employers. MWR web data collection started with data for the first quarter of 2007. The MWR electronic-reporting format is now routinely included in the products of prominent payroll- and tax-reporting software developers. Since 2012, BLS has successfully worked with a contractor to print, mail, receive and scan returned MWR forms to state agencies, substantially reducing their workloads.

It is useful to examine some recent statistics regarding overall MWR data collection. In that regard, the numbers in the following tabulation, for the fourth quarter of 2014, exhibit a stable pattern that has come to be seen as the usual pattern for MWR statistics:

Fourth quarter 2014 (initial enhanced quarterly Unemployment Insurance file)	Number or percentage of employers
Percentage of employers filing the MWR	1.42
Percentage of national worksites	17.35
Percentage of national employment	41.03

As the table shows, approximately 1.4 percent of employers completed the MWR for about 17 percent of national worksites and more than 41 percent of national employment. Moreover, nearly 49 percent of all MWR employment came electronically, from either the EDI Center or MWRweb. Of this 49 percent, the EDI Center collected 20 percent of total MWR employment while MWRweb accounted for almost 29 percent.

Microdata/Macrodata (MIC/MAC) Project. Prior to 1989, states submitted only an enhanced file containing macrolevel employment and wage data. That meant that the highest level of detail received by the QCEW program was aggregate data cells made up of a combination of industry, county, and ownership codes.

In the first quarter of 1989, states began delivering a quarterly microdata file that included individual business establishment data. At the time, states were submitting nine separate deliverables per year: four quarterly

microdata files, four quarterly macrodata files, and the annual Control File, providing Code Change Supplement data.

Development of the MIC/MAC project began in 1994. Teams consisting of BLS staff from both the national office and regional offices, as well as state staff members, were established to define the new processing requirements and deliverable standards. State and BLS systems were updated to reflect these major operational changes. The mission was to create a single quarterly file that would make possible the creation of macrolevel totals from the microdata. The project would promote more efficiency by eliminating duplication of work in reviewing and correcting the micro- and macrodata files. The project would also create uniformity in the micro- and macrolevel totals, as well as in the editing standards for the states and BLS. The first MIC/MAC files were submitted to BLS in the third quarter of 1997, providing for a more efficient work process and producing higher quality data.

SIC-to-NAICS conversion. The SIC system was established in the 1930s in order to classify establishments by their primary type of activity. The system was updated multiple times in its history of being utilized by the QCEW (formerly, ES-202) program; significant changes were made in 1967, 1972, and 1987. In July 1992, the Office of Management and Budget (OMB) established the Economic Classification Policy Committee, chaired by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce, with representatives from the U.S. Bureau of the Census (now the U.S. Census Bureau) of the U.S. Department of Commerce and from BLS. The OMB charged the committee with conducting a “fresh slate” examination of economic classifications for statistical purposes and determining the desirability of developing a new industry classification system for the United States that would be based on a single economic concept. In 1997, NAICS was introduced, the product of a cooperative effort on the part of the official statistical agencies of the United States, Canada, and Mexico.

In the fall of 2002, the QCEW program published its 2001 data using NAICS 2002 classified industry data for the first time. Over several years prior to that milestone, state agencies had worked to convert more than 8 million establishments to NAICS. Along with the initial 1997 version of NAICS and the 2002 update, versions were released in 2007 and 2012 also, to reflect changes to the economy.

One of the major changes to industry coding that was introduced by NAICS was the sector called information (NAICS 51), which includes establishments producing and distributing information and cultural products, establishments providing the means to transmit or distribute these products, and establishments providing data or communications services, including data processing. Another new sector introduced by NAICS was management of companies and enterprises (NAICS 55).

The BLS conversion to NAICS was notable for its detail. An example may be seen in the construction (NAICS 23) sector. Within the specialty trade contractors (NAICS 238) subsector in the BLS implementation of NAICS, each base group in specialty trade contractors—for example, masonry contractors (NAICS 23814) or roofing contractors (NAICS 23816)—is further divided, on the basis of whether the establishment’s predominant activity is in residential construction or nonresidential construction.[2]

Early BEA finance data. BEA is responsible for producing quarterly estimates of gross domestic product (GDP) and personal income (PI). A key component of the GDP and PI numbers is data on wages, from the QCEW program. Prior to 2008, BEA had difficulty estimating wages in a number of industries. The most difficult industry was finance

(NAICS 52), because wage levels for that industry are greatly affected by irregular payments (for example, bonuses and stock options). These irregular payments are usually made in either the fourth or first quarter. In 2008, at BEA's request, BLS agreed to deliver first-quarter macrodata earlier than is customary, in order to enable BEA to adjust its estimates by means of QCEW total wage levels.

In early July of 2008, the 10 states with the largest proportion of national aggregate wages in the finance industry participated in a pilot test of accelerated macrodata delivery to BEA. The early-delivery pilot proved to be highly successful with major national users, such as the U.S. Department of the Treasury and the Council of Economic Advisers, which noted a decrease in revisions. On the basis of this success, BEA asked the QCEW program to provide early macrodata as a deliverable each first quarter, beginning with the first quarter of 2009. The BEA wage estimates that are being improved with QCEW data are national, not state, metro, or local, estimates.

Business Employment Dynamics

The Business Employment Dynamics (BED) program uses QCEW establishment data to produce a quarterly series of gross job gains and gross job losses for the entire economy. The program published its first release in 2003. The data covered the period from 1992 through 2002, with subsequent quarterly updates published since then. (For more on BED, see "Business Employment Dynamics" in the BLS *Handbook of Methods*.

NOTES

[1] For the most recent changes to federal and state UI legislation, see "State law information: comparison of state UI laws" (U.S. Bureau of Labor Statistics, July 10, 2015), http://workforcesecurity.doleta.gov/unemploy/statelaws.asp#Statelaw.
[2] For more information on NAICS, see "North American Industry Classification System (NAICS) at BLS," in *BLS information* (U.S. Bureau of Labor Statistics, May 22, 2014), https://www.bls.gov/bls/naics.htm; and David R. H. Hiles, "A first look at employment and wages using NAICS," *Monthly Labor Review*, December 2001, pp. 22–31, https://www.bls.gov/opub/mlr/2001/12/art3full.pdf.

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More Information

Additional information on the QCEW can be found online at https://www.bls.gov/cew

For questions by Email, see here.

For questions by telephone, please call (202) 691-6567.

For BLS QCEW Survey Respondents:

Multiple Worksite Report (MWR): mwr.helpdesk@bls.gov

Industry Verification Form (ARS): please contact your respective state office.

For more information on data collection forms, please follow “QCEW Reporting” on the QCEW homepage.

For researchers of QCEW data

On-site Visiting Researcher program

For state-published data

The cooperating State Workforce Agencies (SWAs) have labor market information offices that publish and disseminate QCEW data for their states.

For CES use of QCEW data

CES technical note

For OES use of QCEW data

OES survey methods and reliability statement

For BEA use of QCEW data

BEA wages and salary disbursements

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