

Changes affecting the Employment Cost Index: an overview

With the release of March 2006 data, BLS has updated the ECI to reflect the new industry and occupational classifications systems; rebased the index to 2005; and implemented new procedures to account for missing data and to compute seasonal adjustments

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Several simultaneous changes occurred with the release of the March 2006 Employment Cost Index (ECI).¹ The Bureau of Labor Statistics changed the way the ECI classifies industries and occupations by switching from the Standard Industrial Classification (SIC) to the North American Industry Classification System (NAICS) and from the Occupational Classification System (OCS) developed for use in the 1990 decennial census to the Standard Occupational Classification (SOC) system. At the same time, the Bureau updated the base weights used to calculate the index in order to reflect both the new classification systems and changes in the industrial and occupational mix of the Nation's workforce. BLS also changed the way the ECI accounts for missing data and computes seasonal adjustments.

One of the most visible changes was the rebasing of the index. The new base is December 2005. All published ECI series were affected and have the same common base. The previous rebasing of the index was 17 years ago, in June 1989.

The articles in this issue of *Monthly Labor Review* cover the broad spectrum of changes introduced in the March 2006 release of the ECI. Taken together, these articles present the most significant changes to the index in many years. These changes will help ensure that the

index remains an accurate measure of compensation costs in a dynamic economy.

What the ECI measures

The ECI is a measure of change in labor costs. Specifically, it is an employment-weighted measure of change in the cost of employing a fixed set of labor inputs. Labor costs measured by the ECI include wages, salaries, and employer costs of employee benefits.

The ECI, a quarterly series, relates to payroll periods including the 12th of March, June, September, and December. The data are presented as index levels as well as 3-month and 12-month changes.

Like other indexes, the ECI provides the cumulative change in a series from the base month to any date for which data are available. For example, as shown in table 1, the December 2005 index for employer costs for civilian compensation was 180.2, which means that these costs had risen 80.2 percent from the June 1989 base.

Reasons for rebasing an index

Rebasing normally is done when the index values become "very large" or there are significant changes in the index series. Indexes

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are useful for economic analysis, but even before the latest changes, indexes were not available for all ECI series. For a few series that were first published since the previous rebasing period, only percent changes were published. As many new series were introduced to reflect the new classification schemes, the need to include them became more significant. Therefore, this was an appropriate time to change the base period. In addition to providing a common point of reference for all ECI series, both new and continuing, the rebasing provides a visible reminder of all the changes discussed in this issue.

Formula for rebasing

Rebasing involves the standard mechanical process of dividing historical indexes by an index for a particular quarter (or average over several years) and multiplying the result by 100. With the new base at December 2005, the data published for March 2006 and subsequent periods represent the change in the index since the base period began.² The basic formula used is:

$$PI^a = P^r / P^b * 100$$

where

PI^a = the change in the index

P^r = the reference period

P^b = the base period

For example, to rebase a series to December 2005 = 100, simply divide the indexes for 1975 – 2005 by the index for December 2005 and multiply the result by 100. Thus, if the index on a June 1989 = 100 base is 150 in June 1999 and 180 in December 2005, the rebased index for June 1999 will be (150/180)*100=83.3, while the rebased index for December 2005 will be (180/180)*100=100.

Table 1 shows how the index values change for selected series and periods with the introduction of the new base. The change in the index from one quarter to another or from one

year to another is not affected by rebasing (except for rounding.) The percent change in the index for private industry workers between December 2000 and December 2005 is the same whether the index used to calculate the quarterly change has a base of June 1989 or December 2005.

New classification systems

Since the 1970s, BLS had used the SIC to classify the ECI's sample units by industry. However, because of a changing economy, the Bureau switched from SIC to NAICS.

SIC was first created for the Federal Government in the 1930s. It classified establishments by type of activity in which they were engaged, and this allowed the government to collect, tabulate, present, and analyze data relating to establishments. SIC promoted uniformity and comparability in the presentation of statistical data collected by various agencies of the Federal Government, State agencies, trade associations, and private research organizations.

NAICS is a product of cooperation between the United States, Mexico and Canada. NAICS is designed to replace the SIC in the United States and Canada, and the Mexican Classification of Activities and Products of Mexico. In the United States, the SIC was used to classify industries by what they produced, and used a 4-digit code of identification. NAICS is used to classify industries by how they produce a product, and uses a 6-digit code. NAICS divides the economy into 20 sectors.

The ECI also changed the way it classifies workers into occupations. The old system, called the Occupational Classification System (OCS), was developed by the U.S. Bureau of the Census for the 1990 Census of Population. Since that time, a number of Federal agencies worked cooperatively to develop a new way of classifying all occupations in the economy. The *Standard Occupational Classification (SOC) Manual 2000*, notes that "all Federal statistical agencies that collect occupational data will use the new system."³ In addition to providing a means to compare occupational data across agencies and surveys, the SOC better reflects the occupational structure of today's economy. The

Table 1. Effects of the change in the index bases period,¹ Employment Cost Index, compensation costs, selected series and periods

Series	June 1989 (June 1989 = 100)	June 1989 (December 2005 = 100)	December 2000 (June 1989=100)	December 2000 (December 2005=100)	December 2005 (June 1989 = 100)	December 2005 (December 2005 = 100)
Civilian workers	100.0	55.5	156.8	87.0	180.2	100.0
Private industry	100.0	55.4	150.9	83.6	180.4	100.0
State and local government ..	100.0	55.7	148.9	82.9	179.6	100.0

¹ Base periods in parentheses.

NOTE: These data are based on published estimates for the specified

series and periods and do not reflect any of the classification and other changes described in this issue of the *Review*. The information presented here is for illustrative purposes only.

SOC is a hierarchical system that includes more than 800 detailed occupations, some of which may not have existed when the 1990 Census was conducted.

Summary of the articles

The articles in this issue of the *Review* provide a roadmap of the changes that were introduced this year.

Fehmida Sleemi's article, "Employment Cost Index Publication Plans," provides information on classification and other changes affecting published ECI series. With the introduction of new industry and occupation classifications, some series were unchanged, some new series were introduced, while others have a break in continuity or were dropped. Sleemi's article discusses the results of an assessment of statistical reliability of specific ECI series, the introduction of a series excluding workers with volatile pay, and a change in the definition of compensation used in the ECI measure.

The ECI publishes both seasonally adjusted and un-adjusted series. In "Seasonal adjustment in the Employment Cost Index and conversion to NAICS and SOC," E. Raphael Branch and Lowell Mason describe how the ECI applies the standard BLS practice in developing seasonally adjusted series. In addition, they explain the changes made to accommodate the NAICS/SOC conversion and improvements in seasonal adjustment methodology realized from a new data processing system.

Song Yi's article, "Accounting for missing data in the Employment Cost Index," describes the procedure used when respondents do not provide all the data needed to compile the index. Yi highlights the methodological changes in the imputation procedure that were implemented with the publication of the March 2006 index. These changes take advantage of some of the additional information available as a result of the integration of the ECI into the National Compensation Survey.

Stephanie L. Costo writes about the new employment counts in "Introducing 2002 weights for the Employment Cost Index."

The ECI is a Laspeyres index which measures the change in compensation costs over time, using fixed employment weights from a specific base year. The ECI weights are updated periodically to reflect the current industry/occupation employment distribution. It was necessary to introduce new weights in March 2006 because of the switch in industry and occupation classification systems to NAICS and SOC.

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Notes

¹ The Employment Cost Index is part of the Bureau's National Compensation Survey (NCS) program. The NCS is an integrated survey program that provides data on a variety of compensation measures in addition to the ECI. Wage data are published for the Nation, regions, and selected areas. Also part of the NCS survey program is the Employer Costs for Employee Compensation (ECEC) series, which shows employer costs per hour worked for wages and salaries and individual benefits. Another series is the benefits measures, which cover the incidence and detailed provisions of selected employee benefit plans. Additional information on the NCS program is available online at www.bls.gov/bls/wages.htm. ECI data are available at www.bls.gov/ect.

² Index values for seasonally adjusted series (news release tables 1-4) may not equal 100.0 in December 2005. Any differences reflect the application of seasonal adjustment factors to the comparable nonseasonally adjusted series. See E. Raphael Branch and Lowell G. Mason, "Seasonal adjustment in the ECI and the conversion to NAICS and SOC" in this issue.

³ *Standard Occupational Classification Manual*, Executive Office of the President, Office of Management and Budget (Springfield, VA, U.S. Department of Commerce, Technology Administration, National Information Service, October 2000).