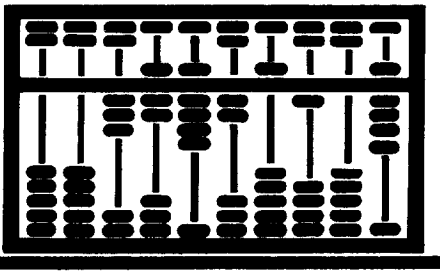
Technical notes



Occupational employment based on 1972 and 1987 SIC

Michael McElroy and Amy Walz

The Standard Industrial Classification (SIC) system[1] is designed to reflect the current industrial composition of the economy. The introduction of the 1987 SIC manual by the Office of Management and Budget presents a challenge for those concerned with converting statistical data that were originally prepared under the 1972 SIC system. This report describes the efforts undertaken by the Bureau of Labor Statistics to produce industry-specific occupational employment estimates for the 1987 Occupational Employment Statistics (OES) survey of nonmanufacturing industries based upon the 1987 SIC system.

The groundwork for the SIC revision was laid several years ago for the BLS establishment-based employment programs. Recognizing that the key to a successful conversion was accurate codes on the 1972 SIC system, BLS funded verification by the State employment security agencies of the industry codes for all establishments. The verification and correction process was conducted for roughly one-third of the firms in each of the three years preceding the revision. After this important process was completed, the State agencies were in a position to accurately determine the 1987 SIC-based codes for the firms.

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Converting industry codes

The revision process involved converting the industry codes for all covered establishments from the 1972 to the 1987 SIC system for the first quarter of 1988. Roughly 85 percent of all firms were in industries encompassed within one 1987 SIC industry. The 1987 SIC codes for firms in these industries, the direct conversion group, were determined solely from the 1972 SIC-based codes. The remaining 15 percent of firms were in industries which embraced more than one industry in the 1987 SIC system. The State employment agencies surveyed firms in these industries, the split conversion group, to determine the correct 1987 SIC code.

For the first quarter of every year, the State agencies submit for sampling purposes files of the universe containing information from more than 5 million firms or units, including monthly employment data. For the first quarter of 1988, the agencies submitted files on both the 1972 and the 1987 SIC basis. In addition to providing this information for each firm, they prepared county-level summary tabulations of employment and wage data (known as the ES–202) at the 4-digit SIC industry level on each SIC system. BLS computed national totals from this information.[2] The information will be of interest to those concerned with evaluating the effect of the revision on a time series at the detailed 4-digit SIC level, for example, engineering services.

The OES program used both the individual firm and 4-digit industry summary results to convert to the new SIC system. It is important to note that the effect of the revision on OES survey employment estimates depends significantly on the level of detail analyzed. For example, variations in occupational staffing patterns at the 3-digit SIC level, resulting from the 1987 SIC revision, may not be clear at the more aggregated 2-digit SIC level.

The Occupational Employment Statistics (OES) survey is a Federal and State establishment-based survey of wage and salary workers designed to produce data on the current pattern of employment by occupation. OES data are collected triennially by industry sector. The survey cycle covers manufacturing industries and hospitals during the first year; selected nonmanufacturing industries during the second year; and trade, transportation, communication, utilities, education, and government services industries during the third year.

Uses for projections

Every other year, the BLS Office of Employment Projections develops a national industry occupation matrix for a base year and for a projected year. These matrices or tables show the employment for each occupation by industry and by percentage of the industry's employment. The occupational percentage in the projected year is divided by the corresponding percentage in the base year to produce a change factor for each occupation in the industry. This change factor, which reflects the relative change in projected occupational employment within the industry, is used by State employment security agency analysts in projecting their industry occupation matrix. Through a series of additional calculations, the State agencies are able to project

Table 1. **Individual and family services: employment for selected occupations, May 1987**

[SIC 832]

Occupation	Employment		Percent of total employment	
	1972 SIC	1987 SIC	1972 SIC	1987 SIC
Total	296,197	371,120	100.00	100.00
General managers and top executives	14,603	18,660	4.93	5.02
Social workers, medical and psychiatric	14,781	21,150	4.99	5.69
Social workers, except medical and psychiatric	27,146	31,820	9.16	8.57
Social service technicians	13,845	17,900	4.67	4.82
Secretaries	12,801	16,710	4.32	4.50
Bookkeeping accounting and auditing clerks	6,519	8,180	2.20	2.20
General office clerks	6,486	8,250	2.18	2.22
Home health aids	59,833	62,610	20.20	16.87
Social welfare service aides	17,245	20,930	5.82	5.63
All other occupations	122,938	164,910	41.53	44.48

the number of job openings for each occupation.

The OES national matrix for each base year is prepared using the three rounds of OES survey data. Because the matrix is produced biennially, one round of survey data is always carried over for use in the next matrix. The 1985, 1986, and 1987 OES survey data were used to produce the national matrix released in 1989. This matrix was based on the 1972 SIC system.

The 1987 SIC-based national matrix, to be released in 1991, will include the 1987, 1988, and 1989 survey data. Because the 1987 SIC-based system was introduced in the OES survey program in 1988, the SIC codes for firms in the 1988 and the 1989 surveys were provided on the 1987 SIC basis. To put all three survey rounds on the 1987 SIC basis, the 1987 occupational employment estimates, which originally were developed on the 1972 SIC basis, were reestimated on the 1987 SIC basis. Thus, the focus of the SIC revision process was to convert the earliest round—the 1987 survey of nonmanufacturing industries—from the 1972 to the 1987 SIC system.

The 1987 OES survey estimates were produced from the survey responses from more than 200,000 firms or units.[3] The process involved recoding the occupational employment data reported by each entity from the 1972-based SIC to the 1987-based SIC. After firms were recoded to the 1987 industry code, new occupational employment estimates were developed by industry.

Comparisons of survey data

To permit comparisons of the 1987 survey estimates on both SIC systems, BLS developed 1987 industry estimates on a 1987 SIC basis for use as a benchmark for the 1987 SIC occupational data. Because employment-by-industry data were available on both systems only for the first quarter of 1988, a 9-month lag existed between then and the second quarter of 1987, when industry estimates were required. Therefore, in creating the 1987 SIC-based industry estimates, BLS assumed that the coefficients (relationship between the 1987 and the 1972 SIC-based data) in the first quarter of 1988 were the same as those in the second quarter.

When comparing the 1987 OES survey estimates on both SIC systems, there is no change at the aggregate level (that is, the summed total of the occupational employment estimates for nonmanufacturing industries on the 1972 SIC basis is the same as the summed total on the 1987 SIC basis). However, most data users are primarily interested in comparing *specific* occupational estimates for specific 2-digit or 3-digit industries so as to detect changes in staffing patterns. The introduction of the 1987 SIC system did change the estimates for some industries both in terms of employment by occupation and by industry for component industries at the 2-digit and the 3-digit level.

As noted, two groups of industries were affected by the revision: industries which remained within the same SIC industry and therefore could be directly converted and industries which spread and therefore could not be directly converted. The following is a summary of the two groups and how they relate to the SIC revision process in the Occupational Employment Statistics.

Direct conversion group. Industries in the direct conversion group include those classifications that (1) had no change in content or SIC code, (2) had no content change but had a code change, or (3) were combined with other industries to form a new industry under a new SIC code or a more encompassing existing industry under the same SIC code. Theoretically, the occupational employment for firms in these industries would be the same under both the 1972 and the 1987 SIC structure. Thus, any occupational employment changes in these industries can be attributed to corrections of the 1972-SIC based codes during the verification and correction process, which preceded the revision. Such code changes caused firms to move from one industry to another, which resulted in slightly different occupational staffing patterns under the 1987 SIC system.

In the direct conversion group, two 1972-SIC-based industries surveyed in the 1987 OES survey of nonmanufacturing industries were significantly affected by the revision. All of engineering, architectual, and surveying services moved from SIC 891 (on the 1972 SIC basis) to SIC 871 (on the 1987 SIC basis) and all of accounting, auditing, and bookkeeping services moved from SIC 893 (on the 1972 SIC basis) to SIC 872 (on the 1987 SIC basis). Although the SIC codes changed from one system to the other, the industry compositions remained the same. In these industries, direct comparisons of employment estimates from the

1972 to the 1987 SIC system can be made for all occupations.

Split conversion group. The split conversion group comprises those 1972 SIC-based industries which spread to more than one 1987-SIC based industry. At least some of these firms moved to other industries because of the revision. In each case, the movement remained within a specified list of industries.

For each 1972-based industry, the 1987 SIC manual (1) specifies the equivalent 1987-SIC-based codes and (2) identifies specific goods or services that were reclassified. For example, the manual shows that part of "social services, not elsewhere classified" remains in SIC 839 and part has been put in "individual and family social services," SIC 832. All of the 1972-based SIC 832 firms remain in that category. In contrast, "probation offices" and "senior associations" are other examples of services that changed from SIC 839 to SIC 832. As a result, industry employment for the two classifications was affected. (The 1987 industry employment for SIC 832 changed from 296,197 to 371,120 and the 1987 industry employment for SIC 839 changed from 246,303 to 171,380). Therefore, even though employment data coded on the 1972 SIC basis are not comparable to data coded on the 1987 SIC basis, the *sum* of the employment data for these two industries under both systems *is* comparable.

Comparisons of the data using both SIC systems can be made at the occupational level of detail. For example, by looking at the 1972 estimates for selected occupations in SIC 832, the data user can see that reported employment for each occupation generally increased because of the revision (table 1). These increases, however, were not proportionately the same for each occupation. For instance, the number of home health aides in SIC 832 increased from 59,833 to 62,610 due to the revision, but the ratio of home health aides to individual and family services employment decreased from 20.20 percent to 16.87 percent. The significant decrease in the ratio suggests that relatively few home health aides were in firms as opposed to services, such as probation offices and senior citizen associations.

SIC 832 is also an example of an industry composition change that affected the 3-digit estimates but not the 2-digit estimates.

Finally, data users should note that even if an industry title remained the same after the revision, the industry composition may have changed. For example, the industry title for SIC 832 is the same on both the 1972 and the 1987-based SIC systems, but the industry composition is different.

THE DATA USER concerned with analyzing occupational employment within specific industries must exercise caution when reviewing data covering periods both before and after the SIC revision. The extent to which comparisons may be made varies by industry. To assist in making such comparisons, BLS published industrial employment totals under each SIC system and is making available occupational employment tables by industry showing how data for the same occupations are summarized under both the 1972- and the 1987-based SIC system. □

Footnotes

[1] The 1987 *Standard Industrial Classification Manual* contains the latest statistical classification standard underlying all establishment-based Federal economic statistics classified by industry.

[2] See *Employment Data Under the New Standard Industrial Classification*, First Quarter 1988, Report 772, 1989. Table 1 shows the relationship of 1987 to 1972 4-digit SIC industries and percent of employment, based on the 1972 SIC, allocated to the 1987 SIC, first quarter 1988.

[3] For the 1987 OES survey estimates on the 1972 basis at the 2-digit SIC level, see *Occupational Employment in Mining, Construction, Fianance, and Services*, Bulletin 2330, 1989. For the unpublished 1987 OES survey estimates at the 3-digit SIC level on the 1972 SIC basis and at the 2-digit and 3-digit SIC levels on the 1987 SIC basis, contact the Bureau of Labor Statistics, Office of Employment and Unemployment Statistics, Room 2913, 441 G Street, NW, Washington, DC 20212. Please indicate the industries of interest when requesting the data.