Implementing the North American Industry Classification System at BLS

This new classification system is a more viable way of classifying industries and tracking new businesses and changes in economic activity; however, the transition period may be challenging to both data collectors and data users

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Recent years have brought many changes in the U.S. economy. The rapid development of telecommunications and the Internet are only two examples of an incredible continuing evolution and progressively changing business environment. Correspondingly, economists and statisticians are improving their tools for measuring the economy. One basic tool is the classification of businesses by industry. Since the 1930s, government statistical programs have published industry data based on the Standard Industrial Classification (SIC) system. Now, these government programs will provide industry statistics based on the North American Industry Classification System (NAICS).[1]

The SIC system, originally designed in the 1930s, has been revised and updated periodically to reflect changes in the U.S. economy. The last revision was in 1987 when a number of new industries such as computer and software stores, video tape rental stores, and plastic bottle manufacturers were added.[2] However, the SIC system still focuses on the manufacturing sector of the economy, and provides insufficient detail for the now dominant service sector. Newly developed industries in information services, health care delivery, and even high-tech manufacturing cannot be adequately studied under the SIC system because they are not separately identified at the industry level. Thus, a new system has been developed that captures the dynamism of the 21st century economy and changes as industry activity develops. The Office of Management and Budget (OMB) announced adoption of NAICS in 1997,[3] and in 2001, announced a revised NAICS for 2002.[4] This article discusses the changes to NAICS as reflected in the NAICS 2002 manual. It also profiles NAICS—discussing its structure, issues confronting data users and collectors, and the implementation schedule for programs at the Bureau of Labor Statistics. A companion article on pages 22–31 provides a first look at employment and wage data based on NAICS.[5]

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The NAICS advantage

NAICS has many advantages over the SIC system. First, it includes new and emerging industries that did not exist when the SIC was developed. These new industries are reflective of the Internet and communications age and the businesses that support them, as well as the changing ways in how we work, shop, and play. New industries such as *semiconductor and related device manufacturing*, *cellular and other wireless telecommunications*, *satellite telecommunications*, and *Internet publishing and broadcasting* are important for understanding the effects of these industries on the future direction of our economy. Also, *telemarketing bureaus* and *temporary help supply services* reflect the changing way of organizing work. The effect of the aging population on the economy is shown in the new industry *continuing care retirement communities*. NAICS separates *convenience stores* and *warehouse clubs* into distinct industries, reflecting shifts in retailing strategies and the shopping habits of consumers. The addition of industries such as *casinos, casino*

hotels, and *bed and breakfast inns* mirrors changes in how we spend leisure time and disposable income. Together, these and other new industries will track developments in the ever-changing economy.

Second, NAICS uses a unified concept to define industries. The former SIC system used a mixture of ways to categorize economic activity—some categories were based on demand groupings (that is, activities that were similar in the eyes of customers or users of the product or service); others were based more on supply groupings. Under NAICS, industries are classified on the basis of their production or supply function—establishments using similar raw material inputs, capital equipment, and labor are classified in the same industry. This approach creates more homogeneous categories that are better suited for economic analysis.

Third, NAICS is used by the United States, as well as by Canada and Mexico, thus giving a consistent tool for measuring and comparing the economies of these three partners in the North American Free Trade Agreement (NAFTA). Consequently, bridge tables or crosswalks no longer are needed to compare sectors across national boundaries.

Structure of NAICS

While NAICS uses a hierarchical structure much like that of the existing SIC, there are a number of important differences. For example, NAICS uses a six-digit classification code that allows greater flexibility in the coding structure; the SIC is limited to only four digits. Another important difference is that NAICS uses the first two digits of the six-digit code to designate the highest level of aggregation, with 20 such two-digit industry sectors. By contrast, the SIC has only 11 divisions, designated by letters of the alphabet. NAICS has no sector for unclassified establishments; SIC has one division that includes nonclassifiable establishments. The following is a comparison of terminology between the two systems (see exhibit 1 for a full list of NAICS sectors and SIC divisions):

NAICS	*SIC*
Sector (two-digit)	Division (letter)
Subsector (three-digit)	Major group (two-digit)
Industry group (four-digit)	Industry group (three-digit)
NAICS international industry (five-digit)	Industry (four-digit)
National industry (six-digit)	

The first two digits in NAICS identify the *sector*. Three NAICS sectors include more than one 2-digit identifiers. *Manufacturing* includes codes 31–33, *Retail trade* comprises 44–45, and *Transportation and warehousing* encompasses 48–49.

The *third* digit of a NAICS code represents the subsector. Using the information sector (sector 51) as an example, there are seven separate subsectors:

51	Information
511	Publishing industries (except Internet);
512	Motion picture and sound recording industries;
515	Broadcasting (except Internet);
516	Internet publishing and broadcasting;
517	Telecommunications;
518	Internet service providers, web search portals and data processing;
519	Other information services.

Exhibit 1. Comparison of the structure NAICS and SIC

NAICS sector	NAICS titles	SIC division	SIC titles
11	Agriculture, forestry, fishing, and hunting	A	Agriculture, forestry, and fishing
21	Mining	B	Mining
22	Utilities	C	Construction
23	Construction	D	Manufacturing
31–33	Manufacturing	E	Transportation, communications, electric, gas, and sanitary services
42	Wholesale trade		
44–45	Retail trade		
48–49	Transportation and warehousing	F	Wholesale trade
51	Information	G	Retail trade
52	Finance and insurance	H	Finance, insurance, and real estate
53	Real estate and rental and leasing		
54	Professional and technical services	I	Services
55	Management of companies and enterprises	J	Public administration
56	Administrative and waste services	K	Nonclassifiable establishments
61	Educational services		
62	Healthcare and social assistance		
71	Arts, entertainment, and recreation		
72	Accommodation and food services		
81	Other services, except public administration		
92	Public administration		

Exhibit 2. NAICS national industry structure for the information sector

Code	Industry
511110	Newspaper publishers
511120	Periodical publishers
511130	Book publishers
511140	Directory and mailing list publishers
511191	Greeting card publishers
511199	All other publishers
511210	Software publishers
512110	Motion picture and video production
512120	Motion picture and video distribution
512131	Motion picture theaters, except drive-ins
512132	Drive-in motion picture theaters
512191	Teleproduction and postproduction services
512199	Other motion picture and video industries
512210	Record production
512220	Integrated record production and distribution
512230	Music publishers
512240	Sound recording studios
512290	Other sound recording industries
515111	Radio networks
515112	Radio stations
515120	Television broadcasting
515210	Cable and other subscription programming
516110	Internet publishing and broadcasting
517110	Wired telecommunications carriers
517211	Paging
517212	Cellular and other wireless carriers
517310	Telecommunications resellers
517410	Satellite telecommunications
517510	Cable and other program distribution
517910	Other telecommunications
518111	Internet service providers
518112	Web search portals
518210	Data processing and related services
519110	News syndicates
519120	Libraries and archives
519190	All other information services

The *fourth* digit of the NAICS code represents the industry group level. Under the *publishing industries (except Internet)* subsector, for example, there are two industry groups:

5111 Newspaper, book, and directory publishers;
5112 Software publishers.

The *fifth* digit in the NAICS code represents the international industry level. Continuing with the same example, there are 30 international-level industries in the information sector. In most cases, there will be comparability between the classifications of the United States, Canada, and Mexico at the five-digit level.

The *sixth* digit designates national detail. This allows the flexibility to create more indepth statistics for the industries that hold particular importance in each country. Most six-digit industries end in a zero, thus signifying that there is no additional detail below the five digits. However, some six-digit industries end in a number other than zero, meaning that the fifth digit was split into two or more U.S. industries. For example, in the United States, the five-digit international industry 51811 *Internet service providers and web search portals* has been split into two six-digit industries: 518111 *Internet service providers* and 518112 *web search portals*. Data now are available for these Internet businesses separately under NAICS; this was not possible under the SIC. Thus, of the 30 international industries within the information sector, 12 have splits below the five-digit level. As a result, the U.S. NAICS manual contains a total of 36 six-digit national industries in the information sector. (Exhibit 2 shows the NAICS six-digit national industry structure for the information sector.)

When the national detail is the same in more than one country, the same six-digit code is used in each country's national version of NAICS. The six-digit system allows for greater data comparability among the three NAFTA partners than does a four- or five-digit system. There had been significant differences in the former classification systems used by the NAFTA partners; NAICS creates a standard system to be used by each trading partner.

Other key differences. Data users should be aware of a few key differences between the SIC and NAICS. There is no relationship between the numeric industry codes used in the SIC and those used in NAICS. (See exhibit 3.) Each system is separate and distinct. For instance, the auxiliary establishments are treated differently between the two systems. Auxiliaries are establishments primarily engaged in performing management or support services for other establishments of the same enterprise. These support services are not intended for outside use. The SIC deals with auxiliary establishments by assigning them the industry code of the parent company that the establishment supports.[6] For instance, a headquarters for an automobile manufacturing company would be coded as SIC 3711 *motor vehicles and passenger car bodies*, even though employees in that office undertake planning and decisionmaking roles in the company. As a result, the employment and wages of the headquarters are included in the statistics gathered on that parent company. The idea under SIC is that auxiliaries such as a headquarters generally draw resources from a parent company and thus should be included in the costs of doing business. In other words, all inputs in the business should be counted together in the same industry.

In contrast, NAICS classifies establishments based on what they actually do. Therefore, businesses, organizations, and institutions are given the industry code of their main activity without regard to the parent company. As a result, the automobile

Exhibit 3. Comparison of the information industry under NAICS and SIC

NAICS code	NAICS industry	SIC code	SIC industry
51	Information		No comparable grouping
511	Publishing industries, except Internet		No comparable grouping
5111	Newspaper, book, and directory publishers		No comparable grouping
51111	Newspaper publishers		
511110	Newspaper publishers	2711	Newspapers: publishing, or publishing and printing (part)
51112	Periodical publishers		
511120	Periodical publishers	2721	Periodicals: publishing or publishing and printing (part)
		2741	Miscellaneous publishing (part)
51113	Book publishers		
511130	Book publishers	2731	Books: publishing, or publishing and printing (part)
		2741	Miscellaneous publishing (part)
51114	Directory and mailing list publishers		
511140	Directory and mailing list publishers	2741	Miscellaneous publishing (part)
		7331	Direct mail advertising services (part)
51119	Other publishers		
511191	Greeting card publishers	2771	Greeting cards (part)
511199	All other publishers	2741	Miscellaneous publishing (part)
5112	Software publishers		
51121	Software publishers		
511210	Software publishers	7372	Prepackaged software (part)

headquarters mentioned in the previous example would be assigned NAICS 551114 *corporate, subsidiary, and regional managing offices*. Headquarters (except Government establishments) are included in this NAICS industry. This is consistent with the principles of NAICS that establishments should be grouped together based on their production processes.[7]

There will be a reduction in employment reported for industries in which headquarters are reported as separate establishments. As a result, employment and wage data for manufacturing industries may be lower under NAICS than under the SIC because of this shift out of manufacturing into NAICS 551114. This treatment also poses a challenge for data collectors because they must be sure to separately identify locations that are strictly headquarters from other locations that conduct business as well as manage the operation at the same location.

Another difference between the SIC and NAICS is in the number of industries. The SIC system has 1,004 detailed industries (excluding the one for nonclassifiable establishments); NAICS has 1,179. In some instances a SIC was broken into different NAICS industries creating more industry level detail. Likewise, some SIC codes were combined into one NAICS code, thus collapsing previous differentiation. As a result, the introduction of six-digit NAICS codes does not necessarily mean that there is a corresponding increase in the level of detail in the entire national structure.

The Bureau of Labor Statistics will provide further industry detail in NAICS by adding 19 industries in subsector 238 *specialty trade contractors*. These additional industries will provide data about residential and nonresidential contractors. Some of the new industries will include residential and nonresidential roofing contractors, and residential and nonresidential electrical contractors.

Ongoing revisions

Just as the SIC system was revised periodically, NAICS also will require revisions to reflect the dynamic changes occurring in the economy. In fact, NAICS has already experienced changes. The original version is referred to as NAICS 1997. However, since that manual was published, the three NAFTA countries have extended agreement in the *construction* sector to five digits in all areas, except 238 *specialty trade contractors*. This subsector is now comparable with Canada and Mexico at the four-digit level. In NAICS 1997, *construction* had only been comparable at the two-digit sector level. The NAICS 2002 manual also recognizes important changes in the *information* sector. New industries have been added for *Internet publishing and broadcasting*, in addition to *Internet service providers*, and *web search portals* mentioned earlier. For NAICS 2002, the three NAFTA countries were unable to

come to agreement below the two-digit sector in *wholesale trade*, but the United States has included two new industries in its classification system to reflect the importance of wholesale trade activities on the U.S. economy. One industry added is *business to business electronic markets*, the other is *wholesale trade agents and brokers*. Some industries in *retail trade* have been further broken out in the NAICS 2002 manual. The NAICS 1997 manual grouped department stores together, regardless if they were *department stores* or *discount department stores*. NAICS 2002 now makes this distinction as well as separating establishments that had been classified as *electronic shopping and mail order houses*. This industry now is classified as three distinct industries: *electronic shopping*, *electronic auctions*, and *mail-order houses*. The other NAICS sectors were untouched.

The Bureau of Labor Statistics will convert its programs directly from SIC to NAICS 2002. Bypassing NAICS 1997 will reduce the confusion to data users of multiple series breaks over a very short period.

As was the SIC system, NAICS will be reviewed periodically, and OMB will determine whether a significant revision is needed. Future revisions may focus on reaching comparability in areas of the classification system that are not agreed upon at the five-digit level. Regardless, small modifications and interpretations will be studied and implemented on a continuous basis.

Implementation at BLS

NAICS requires a significant effort to implement. Large universe programs such as the BLS Covered Employment and Wages (ES-202) program assigned new industry codes to the approximately 8 million business establishments in the United States.[8] NAICS codes were assigned over a 4-year period beginning in 1998. That work is now finished, and the data can be examined.[9]

Sample-based programs cannot convert to NAICS until the universe frames on which they are based have been revised. Programs that use data from the universe and from sample programs will be the last to implement NAICS. The Producer Price Index (PPI), for example, uses BLS universe data for its sampling frame, data from the Economic Census for its structure weights, and other data produced by the Department of Commerce for its net output calculations. As a result, the conversion of the PPI to NAICS cannot be fully implemented until these programs have each converted to the new classification system. (The timetable for BLS conversion to NAICS is shown in exhibit 4.)

Some BLS programs will use a higher level of aggregation in the publication of NAICS data. This alternative aggregation structure allows for easier presentation of data in news releases and reduces the need to suppress information because of confidentiality rules. The alternative aggregation contains two groupings with 12 'supersectors,' instead of the 20 NAICS sectors. The first grouping in the aggregation is *goods producing*. It contains three supersectors: *natural resources and mining*, *construction*, and *manufacturing*. The second grouping is *service providing*. It includes the remaining nine supersectors: *trade, transportation, and utilities; information; financial activities; professional and business services; education and health services; leisure and hospitality; other services; public administration;* and *unclassified*.

This NAICS alternative aggregation structure has been reviewed by the Office of Management and Budget and is recognized by the Economic Classification Policy Committee. Programs at the Bureau of Labor Statistics will use it whenever publication of the full 20 NAICS sectors is impossible.

Issues facing data users

Although the implementation of NAICS will undoubtedly benefit most data users, the transition period is likely to pose some challenges. There will be breaks in many time series that are based on the SIC system. The availability of time series data is essential for trend analysis, economic forecasting, and seasonal adjustment. In many cases, however, the NAICS changes are so significant that reconstructing historical data based on the new system will be difficult. For example, the old SIC system had no category for "telecommunications resellers" and, hence, very little data were available for this industry. Similarly, at the higher levels of aggregation—such as the manufacturing or services divisions—many economic activities formerly classified in one division are now classified in another.

Another issue for data users involves the transition period, when some data will be based on the SIC and other data will be based on NAICS. (As previously noted, most government and other statistical organizations will implement NAICS over several years.) The resulting lack of comparability will challenge economic analysts. Also, agencies may implement different versions of NAICS. BLS, as stated above, is moving directly from SIC to NAICS 2002 over a 4-year period. The Bureau of Census conducted the 1997 Economic Census using NAICS 1997 and will use NAICS 2002 in the 2002 Economic Census. The Bureau of Economic Analysis (BEA) combines data from several sources to create other series such as the national accounts and gross domestic product. BEA, like many other users, will have to understand each of the NAICS versions to fully and accurately reflect the differences among SIC, NAICS 1997, and NAICS 2002. Further updates to NAICS will be studied periodically and new industries may be added in order to measure emerging industries.

Reconstructing historical data

During the transition, it may be difficult for some data users to appreciate the potential benefits of NAICS. BLS recognizes

Exhibit 4. Timetable for implementing NAICS at the Bureau of Labor Statistics

Office or program	Conversion reference period	Publication date
Office of Employment and Unemployment Statistics:		
Current Employment Statistics	May 2003	June 2003
Mass Layoff Statistics	January 2002	March 2002
Current Population Survey	January 2003	February 2003
Occupational Employment Statistics	2002, fourth quarter	January 2004
Covered Employment and Wages	2001	Fall 2002
Job Openings and Labor Turnover Survey[1]	To be announced	To be announced
Office of Employment Projections:	2004–14	November 2005
Office of Productivity and Technology:		
Productivity measures for selected industries	2001	2003, fourth quarter
Foreign Labor Statistics	2003	Late 2004
Office of Compensation and Working Conditions		
National Compensation Survey—		
Employment Cost Index	March 2005	April 2005
Employer Costs for Employee Compensation	March 2005	June 2005
Locality wage levels	Spring 2005	Spring 2005
National and census division publications	2004	Spring 2005
Integrated benefit provision product	2004	Spring 2005
Occupational Safety and Health Statistics—		
Survey of Occupational Injuries and illnesses	2003	December 2004
Census of Fatal Occupational Injuries	2003	August 2004
Office of Prices and Living Conditions:		
Producer Price Indexes	January 2004	February 2004

[1] Job Openings and Labor Turnover Survey (JOLTS) is currently under development. First release of information, in early 2002, will be SIC based.

NOTE: This timetable is current as of December 2001, but is subject to change.

the needs of the users for historical data to construct time series, and is investigating approaches for doing so in some programs.

In the Covered Employment and Wage program (commonly known as ES-202), it may be possible to reconstruct up to 10 years of NAICS-based data. At a minimum, BLS plans to create a set of SIC/NAICS employment ratio tables that can also be used to reconstruct macro level employment time series. These percentage relationships would be applied to existing employment series to derive a possible replacement series.

The Current Employment Statistics (CES) program that provides monthly payroll employment will reconstruct time series for NAICS-based employment data for the Nation, States, and areas. The national CES series for total nonfarm employment, as well as NAICS supersectors, will be available back to 1939. Start dates for finer levels of industry detail will be variable, dependent on the current start date of the series and the extent of the SIC-to-NAICS series breaks. State and area data will be available for total nonfarm employment also back to 1939. However, supersector employment data will only be published back to January 1990, as will employment data for finer levels of detail.

CES data series on hours, earnings, production workers, and women workers will be reconstructed back to their current start dates for the national CES total private and supersector series. No historical reconstruction will be done for these data types for State and area data series.

One of the challenges of developing historical data is ensuring that relatively new industries do not appear before they actually started. (For instance, *electronic shopping* on the Internet was not possible until recently.) As data series are developed, they will be reviewed for obvious historical inaccuracies.

Productivity data. The complexity of converting to NAICS is shown in another BLS program. For the industry productivity program, the current plans are to publish in late fall of 2003 time series (indexes) of output per hour for industries, converted to a NAICS basis. The timing of this conversion is guided by the availability of historical employment and hours on a NAICS basis and on the conversion of historical output series to a NAICS basis. Industry unit labor cost and multifactor productivity series will be converted to a NAICS basis at a later date. For all presently developed industry productivity series, conversion to a NAICS basis will begin with 1992 or earlier data. Eventually all series will be converted beginning with 1987 data, or the initial year of the series if that year is later than 1987.

Labor productivity is the ratio of the amount of goods and services (output) to total hours of labor worked. The conversion of industry productivity series to a NAICS basis involves converting both the output and hours series. The output measures for many industry series will be converted using data at or below the four-digit SIC level (six-digit NAICS level). The hours worked and compensation series will be converted at the four-digit SIC to six-digit NAICS level using the historically revised data being developed by the Current Employment Statistics program of the Bureau of Labor Statistics

Manufacturing output measures are developed, most often, from five-digit SIC (seven-digit NAICS) product class data. The product class data are aggregated according to a Tornqvist index formula to an industry output index. More than half of the product classes are direct matches between SIC and NAICS. For product classes that are not direct matches, an algorithm has been developed to estimate the SIC product class data from NAICS product class data and vice versa.

Retail trade output series are developed from revenue data classified by merchandise line sales for each industry. The deflated merchandise line sales for each industry are aggregated according to a Tornqvist index formula to compute the industry output index. For those retail industries that are not exact matches, conversion of the output series from a SIC to NAICS basis will be accomplished by adjusting the amount of revenue of merchandise line sales per industry and aggregating.

The output series for utilities, communications, transportation, and service industries that are not exact matches between SIC and NAICS will be adjusted at the greatest amount of detail possible. Specific methods have not been developed for each of the industries. With the exception of some adjustments for copper mining and nonmetallic minerals, there is a direct match between the SIC system and the NAICS system for all mining industries for which the Bureau has productivity measures. These industries will be assigned the NAICS code.

THE NAICS REVISION presents a tradeoff between a new and improved classification system, which will help provide data for many new industries that formerly were not classified separately, and the inevitable time series breaks that occur whenever major revisions to classification systems or statistical programs are implemented. The economy of the United States has changed significantly since data were first published using the SIC system. Even though the SIC has been revised and updated periodically, its focus on manufacturing does not provide sufficient detail for the dominant service sector. Thus, the United States, along with Canada and Mexico, developed NAICS, which captures these new and emerging industries, uses a unified concept to define industries, and is a consistent and comparable tool for measuring the economies of the three NAFTA trading partners. Converting to NAICS may be difficult—the conversion will not be simple for agencies or data users. However, BLS and other agencies will facilitate this move wherever possible. In the long term, NAICS will prove to be a viable and more accurate way of classifying and measuring economic activity. □

Notes

[1] See *North American Industry Classification System—United States, 1997* (Executive Office of the President, Office of Management and Budget).

[2] See *Standard Industrial Classification Manual* 1987 (Executive Office of the President, Office of Management and Budget).

[3] See *Administration introduces new industry classification system* (Executive Office of the President, Office of Management and Budget, April 8, 1997). For a Bureau of Labor Statistics perspective on NAICS, see John B. Murphy, "Introducing the North American Industry Classification System," *Monthly Labor Review*, July 1998, pp. 43–47.

[4] See *North American Industry Classification System—Revision for 2002* (Executive Office of the President, Office of Management and Budget). The new manual will be released by spring 2002 and may be ordered from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161

[5] See David R. H. Hiles, "A first look at employment and wages using NAICS," this issue, pages 22–31.

[6] See *Standard Industrial Classification Manual 1987*.

[7] See *North American Industry Classification System—United States, 1997*, p. 11.

[8] For more information on the Covered Employment and Wages program, see *BLS Handbook of Methods*, Bulletin 2490 (Bureau of Labor Statistics, April 1997), pp. 42–47.

[9] Hiles, "A first look at employment and wages."