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## **Progress Toward Completing Historical Production Accounts using the North American Industry Classification System**

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## **Abstract**

This paper reviews efforts to create historical industry time series information classified on a North American Industry Classification System (NAICS) basis. Some of these projects have been completed by the various U.S. statistical agencies and others are being pursued, some on an exploratory basis. There is a good prospect that these projects could lead us back to a situation where many industry time series measures are available that span the past three to four decades. However, this type of work is difficult and problematic. The quality of the series that can be generated often depends on difficult work with very detailed data. Statistical agency staff members have been meeting to discuss and coordinate efforts.

## **1. Background**

The Census Bureau, the Bureau of Economic Analysis (BEA) and the Bureau of Labor Statistics (BLS) are nearing the completion of a major effort to present their industry statistics in line with the North American Industry Classification System (NAICS). Now that survey data are available on a NAICS basis, the final step has been to convert “downstream” programs that use tabulated raw data from a variety of data sources to create more intricate measures. Examples are the BEA programs on national accounts, industries, and states and the BLS programs on productivity and employment projections.

The timing of the NAICS conversion of these downstream programs coincides with a new collaborative effort to better integrate the BEA national accounts, input-output accounts, industry output measures, and the BLS productivity statistics. The goal of this effort is to create “production accounts” for both the business sector and the entire economy that include industry data on a NAICS basis. Broadly, a production account

would bring together information on industry outputs, inputs and productivity. The information in a production account would support research that explores the sources of growth of GDP and of productivity.

A production account would provide this information on a basis in which industrial coverage is consistently defined across various outputs and inputs and over time and which is complete in its coverage. Data would need to be adjusted to address issues of inconsistency as they are placed into the account. A production account would include both nominal and real components. In each year the nominal account would reconcile the value of output with input costs at the aggregate level, it would do the same for a complete subset of industries, and would trace the interindustry flows of goods and services. The real account would track rates of change over time in real flows of output and of labor, capital and intermediate inputs by industry.

A detailed paper on production accounting was provided at a 2004 conference on National Accounts Architecture sponsored by the Conference on Research in Income and Wealth (CRIW). A revised version of that paper (Fraumeni, Harper, Powers and Yuskavage [2005], FHPY) has been provided to FESAC members as further background. One theme of that paper was to find the sources of differences between BEA and BLS output measures. Our other paper for this FESAC session, "Comparison of BEA and BLS NAICS-based Output Measures," describes our efforts to begin this activity for NAICS data.

The NAICS was the result of an intensive collaborative research effort by statistical agencies in Canada, Mexico and the United States. Data tabulated under NAICS are more useful for studying the modern economy and for ensuring comparability

of data in the three countries. Having said that, the conversion of data systems to NAICS has been a daunting challenge for many programs in each of the three U.S. statistical agencies, and the issue of retabulating historical data on a NAICS basis has been a secondary priority to producing current estimates. Complicating matters is the fact that there are two versions of NAICS (1997 and 2002). Some data that are currently available are on one version, and some on the other.

Since the conversion of “downstream” programs to NAICS necessitates a fair amount of redesign of data systems, it represents an opportunity to incorporate information that reconciles and better integrates the data, providing an improved basis for constructing a production account. The present paper has been prepared to describe agency projects, some complete and some still being planned, that could lead to historical production accounts. Historical production accounts are used by economists, both those primarily interested in past history and those interested in the future. Economic forecasters make critical assumptions about future productivity growth based on a detailed understanding of the sources of past growth. For example, the recent dramatic gains in aggregate productivity have been linked to high tech investments through rigorous accounting of historical shifts in industry output and in investment inputs. Conclusions rest on comparing developments in the past decade with previous decades. Other important structural shifts have occurred, such as the shift from manufacturing to services. This shift has continued over a very long time period and has had implications for productivity and labor markets. To examine these trends, many forecasters, analysts and researchers find it valuable to work with industry data that have been consistently tabulated over very long time spans.

During the past year the authors have held several informal meetings with staff in various programs of the three statistical agencies to discuss and coordinate work related to production accounts. The meetings have been useful in exchanging information about the plans, needs and resource constraints of the various programs. They have also been useful in keeping some attention on the issue of historical NAICS data and in compiling the information in this paper. Prof. Dale Jorgenson of Harvard University, who has participated in these meetings, has suggested that a reasonable goal would be to reconstruct the ingredients needed to measure total factor productivity for about 65 industry divisions classified according to NAICS back to 1973. The 65 industry level of detail would correspond to the NIPA industry structure under NAICS. These ingredients include nominal and real gross output, labor hours, labor compensation, labor composition effects, nominal and real intermediate inputs, investment by disaggregate types of asset, capital stock, capital services and property income. We note that some customers and “downstream” programs do not need this much information while others would like additional industry detail and earlier history.

In order to have historical production accounts spanning several decades, it will be necessary to estimate NAICS time series for each of many categories of industry outputs and inputs. The problem of changes in the industrial classification is not new with NAICS. Periodic changes occurred in the older Standard Industrial Classification System (SIC). Statistical agency programs did publish time series estimates that depended on linking approaches. The quality of the links varied depending on the care and detail with which they were performed and also on the extent of redefinitions in the various SIC changes. In contrast to SIC changes, the 1997 NAICS differs quite

significantly from the 1987 SIC. The NAICS introduced new principles by which it groups producing units into industries and this led to some major structural differences, such as changes in the boundaries of manufacturing.

As part of the NAICS conversion processes, some statistical agency programs provided historical data on a NAICS basis. Subsequent to that, additional projects have been started to transform more data. There are two major types of approaches to doing NAICS conversions on “raw” data. The traditional one involves taking a table, for an overlap year, that comprehensively maps two classification systems and which includes data classified both ways for a “measure of interest”. Many higher-level industries can simply be shifted and retabulated if detailed industry information is available under the old classification system. This approach has a shortcoming when the new system contains new industries that did not exist in the old system because it may not be possible to determine, from archives tabulated on the old system, how to split industries into categories specified in the new system. The approach also has shortcomings if historical data are not available in enough detail or if historical data are not available for the “measure of interest”. This approach therefore requires assumptions that carry relationships back to years prior to the overlap. A second approach is to go back to the original microdata, reclassify establishments, and retabulate all measures. Conversion of “downstream” data systems to NAICS requires good quality “raw” data from many sources and often involves other issues as well.

The balance of this paper summarizes some completed projects and some exploratory projects related to NAICS conversion of data that would be useful in production accounts. Section 2 describes some projects that are already complete.

Section 3 describes research efforts that are currently underway at each agency to develop more data on a NAICS basis, to extend the series further back in time, or to improve the quality of the historical information.

## **2. Current Information and Historical NAICS-Classified Industry Time Series Already Published by BEA, BLS and Census**

In this section we summarize those data being produced on a NAICS basis that will be particularly useful in developing production accounts. This is not meant to be a comprehensive list of NAICS products, as the statistical agencies have many additional programs that publish industry data on a NAICS basis.<sup>1</sup>

### **Census Bureau**

The first statistical program to convert to NAICS was the Census Bureau's Economic Census program, collecting, tabulating, and publishing the 1997 data on the basis of NAICS 1997. The Census Bureau published a "bridge table" for 1997 that contained a mapping between four-digit SIC industries and six-digit NAICS industries, which included information on payroll, employment, and shipments (or receipts). This has been valuable to customers and downstream programs interested in linking historical data to the NAICS.

The Census Bureau reclassified historic data for three Census Bureau programs. The Manufacturing and Construction Division (MCD) recast the M3 – Manufacturer's Shipments, Orders, and Inventories on a NAICS 1997 basis – back to 1992. They used

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<sup>1</sup> For example, BEA publishes measures of gross state product (GSP) by industry on a NAICS basis for 1998-2002 and state personal income, earnings, compensation, and wages by industry, for 2001-2004. The GSP measures are described in the January 2005 issue of the Survey of Current Business. The BLS publishes numerous statistics including employment, compensation and producer prices on an industry basis. Most of these have been converted to NAICS or will be converted in the near future. The complete BLS NAICS conversion schedule is available at [https://www.bls.gov/bls/naics\\_implementation.htm](https://www.bls.gov/bls/naics_implementation.htm).

bridge table information and aggregate time series methods, but checked their findings with 1992 Census of Manufacturing micro data reclassified on a NAICS 1997 basis at the Center for Economic Studies (CES).

The Services Sector Statistics Division's Monthly and Annual Surveys of Retail and Wholesale Trade also have been classified on a NAICS 1997 basis back to 1992. In this case, the surveys were benchmarked directly to the 1992 Census of Retail Trade and 1992 Census of Wholesale Trade microdata recast on a NAICS 1997 basis.

## **BEA**

### *Benchmark Input-Output Accounts*

The 1997 benchmark input-output (I-O) accounts present industries on the basis of the North American Industry Classification System (NAICS). These accounts, which were published in the December 2002 Survey of Current Business (Survey), show the flows of 483 commodities to 491 industries and to 13 final uses. NAICS-based classifications are more in line with the principle underlying the I-O classifications: Industries are classified in the I-O accounts so that each industry has a unique production function. As a result of the incorporation of NAICS, the 1997 benchmark I-O accounts provide a more detailed presentation of the increasingly important service industries.

### *Capital Flow Table*

The 1997 NAICS-based capital flow table, which was published in the November 2003 Survey, supplements the 1997 benchmark I-O accounts. The use table from the benchmark I-O accounts shows the materials and services input requirements for each industry. The capital flow table shows the structure of flows of new capital goods and

services for each industry. It provides the most detailed view of investment by commodity and by using industry, showing flows of 180 commodities to 123 private sector industries.

### *Integrated Industry Accounts*

The integrated industry accounts are a set of integrated estimates that include the Annual Input-Output (I-O) Accounts and the Gross-Domestic-Product (GDP)-by-Industry Accounts. Integrated accounts present fully consistent measures of gross output, intermediate inputs, and value added by industry. Currently, the Annual I-O Accounts and GDP-by-Industry Accounts are integrated, beginning with estimates for 1998. Prior to integration, the two sets of accounts were often inconsistent because of the use of different methodologies, classification frameworks, and source data. Producing integrated industry accounts required BEA to reconcile these differences. The integration of these accounts eliminated inconsistencies and improved the accuracy of both sets of accounts. BEA's longer-term goal is to integrate all industry accounts, including the benchmark I-O accounts, annual I-O accounts, GDP-by-industry accounts, and gross state product accounts.

### *Annual I-O Accounts*

The Annual I-O Accounts are presented at the 65 industry level of detail, including 61 private and 4 government industries--federal general government and government enterprises and state and local general government and government enterprises. They are consistent with the 2003 comprehensive revision of the national

income and product accounts (NIPAs) as well as the GDP-by-industry accounts. These accounts provide detailed information on the changing structure of the U.S. economy, including the annual contributions of private industries and government to the Nation's GDP and the annual flows of goods and services used in the production processes of industries.

#### *GDP-by-Industry Accounts*

BEA prepares estimates of value added for 61 private and 4 government industries. Value added is a measure of the contribution of each private industry and of government to the Nation's GDP. It is defined as an industry's gross output (which consists of sales or receipts and other operating income, commodity taxes, and inventory change) minus its intermediate inputs (which consists of energy, raw materials, semi-finished goods, and services that are purchased from domestic industries or from foreign sources). The value-added estimates by industry are available in current dollars. Real, or inflation-adjusted, estimates are also prepared by BEA.

BEA published the NAICS-based 1998-2003 integrated GDP-by-Industry Accounts and the I-O Accounts in the June 2004 Survey. The revised estimates of the integrated accounts for 2001-2003, including more detailed estimates for 2003, were published in the January 2005 Survey.

#### *Backcast NAICS-Based GDP-by-Industry Estimates, 1987-1997*

BEA published estimates of GDP-by-industry for 1987-97 based on the 1997 North American Industry Classification System (NAICS) in the November 2004 issue of

the Survey. The industry definitions are the same as those used for the integrated annual industry accounts for 1998-2003 that were released in June 2004 as part of the comprehensive revision. For 65 detailed NAICS industries and related industry groups, BEA provided estimates of current-dollar and real gross output, current-dollar and real intermediate inputs, current-dollar and real value added, and the three major components of current-dollar value added: Compensation of employees, “taxes on production and imports less subsidies,” and gross operating surplus.

For current-dollar estimates, the revised industry estimates from the comprehensive revision based on the 1987 Standard Industrial Classification (SIC) system were converted to NAICS industry estimates using “conversion matrices” that indicate the share of an SIC industry estimate allocated to a particular NAICS industry. These conversion matrices were computed for gross output and for each of the major components of current-dollar value added. An important feature of these matrices is that the allocation shares change over time to reflect changes in the relative importance of NAICS industries, rather than remaining fixed based on the 1997 SIC-NAICS concordance. Detailed SIC-based industry shipments, sales, and receipts series that were matched to detailed NAICS industry data for 1997 were used to extrapolate the 1997 concordance annually back to 1987.

Real estimates (chain-type quantity indexes) of gross output, intermediate inputs, and value added were prepared for each of the 65 detailed industries and for related industry groups. Real value-added estimates were computed using the double-deflation method after first computing Fisher price indexes for industry gross output and for intermediate input commodities from the detailed SIC-based price index series in the

benchmark concordance. These price indexes were generally available at the same level of detail as the shipments, sales, and receipts data. The double-deflation procedure used for these estimates is a close approximation of the procedure used for the revised SIC-based estimates, and it is similar to the procedure used for the integrated estimates. Approximate versions of NAICS-based industry use tables were prepared at summary levels for selected years a part of the double-deflation procedure.

*Investment and Capital Stock Data:*

BEA recently released NAICS-based estimates of net stocks and depreciation of fixed assets and of the investment flows used to derive them, beginning with 1987. For most asset types, estimates for net stocks were derived by industry (1997 NAICS basis), by asset type, and by legal form using the perpetual inventory method beginning with 1901. For assets that existed prior to 1901, the existing stock levels for 1901 (by asset type) were distributed to NAICS industries by legal form using detailed investment shares from 1901 (investment by industry, by type and by legal form).

Very broadly, investment estimates were converted at the most detailed level (by asset and by legal form) from an SIC basis to a NAICS basis using a multi-step bridging process. The process was designed to retain as many of the desirable characteristics of the previously published investment flows as possible (especially legal form information) while incorporating NAICS-based estimates from the 1997 Capital Flow Table and 1997 Economic Census. A primary goal for the historical based NAICS estimates was to preserve previously published asset mix and legal form shares for “special” industry aggregates (approximately 25). These special aggregates were defined such that the asset

type and legal form shares should be comparable whether they are derived from SIC industries or NAICS industries. The process incorporated many different sources, including published BEA fixed assets, 1997 Economic Census, 1997 Capital Flow Table, Census Enterprise Statistics and Census Annual Capital Expenditures Survey data.

## **BLS**

### *Employment and Hours:*

The BLS Division of Current Employment Statistics (DCES) first published monthly data on employment, average weekly hours, and average hourly earnings on a NAICS basis in early 2003. All National level CES industry series were reconstructed on a NAICS basis back to at least 1990. At the NAICS super sector and higher levels, the reconstruction was carried back to 1939, the existing start date for SIC major industry division series. For finer levels of industry detail, start dates for the reconstructed NAICS-based series varied depending on the scope of the definitional change between SIC and NAICS. Series that were nearly identical between SIC and NAICS were reconstructed back to the SIC start date. The reconstruction methodology was straightforward. BLS had just one dual coded quarter of UI-universe based micro level data which contained both SIC and NAICS codes for every business in the universe file. From this file, ratios were calculated that mapped employment from SIC series to corresponding NAICS counterparts. Ratios were then applied to existing CES series to form NAICS-based series.

As an example, March 2001 ratios indicated that NAICS 325 (chemical manufacturing) was formed from 95% of SIC 28 (chemical manufacturing), 3% of SIC

30 (rubber and plastics), and 2% of SIC 38 (instruments). To produce the NAICS 325 historical series, these percentages were applied to the historical SIC series and the results summed. An analogous procedure was used to reconstruct hours and earnings series. The NAICS-based series were produced from a weighted average of SIC component industries. The weights were the NAICS/SIC ratios.

One advantage of this methodology was that it allowed for comprehensive reconstruction at minimal cost and it preserved overall CES time series properties; there were no outliers or level shifts in the resultant reconstructed series, because such issues did not exist in the published SIC series. The method also preserved overall CES seasonal patterns, important to providing a historical time series that could be used to produce viable seasonal factors going forward.

Obvious limitations of the methodology are that the 2001 NAICS/SIC ratios may not be appropriate historically, and the method therefore had the potential for distorting trends in rapidly growing or declining industries. For these type industries, additional review was undertaken including comparisons to UI longitudinal microfiles which were NAICS-coded back to 1990. As an example, the hotel industry was split into casino hotels and all other hotels with the NAICS conversion. The review of UI microdata indicated differing seasonal patterns and growth trends for the two segments from 1990-2000. The casino hotels were growing rapidly and had a much milder seasonal pattern than other hotels. Therefore this data, rather than the simple ratio method, was used to reconstruct these two series. For most industries the ratio method either produced similar results to a microdata-based method or produced superior results, in that the microdata

method resulted in frequent level shifts or outlier observations that appeared to be non-economic in nature.

*Industry Labor Productivity:*

The BLS Division of Industry Productivity Studies (DIPS) publishes labor productivity and cost measures from 1987 forward for all 3- and 4-digit NAICS industries in manufacturing, retail trade, and wholesale trade. This includes measures for 21 3-digit and 86 4-digit NAICS industries in manufacturing and for over 90 selected 3- and 4-digit industries in mining, utilities, trade, transportation, and services. Measures for additional selected industries at the 5- and 6-digit NAICS level are maintained by DIPS and are available upon request. Except for a few industries where the physical quantity of output is measured, most output measures used by DIPS are sectoral measures that are constructed using detailed revenue data from the Census Bureau. For manufacturing industries, the output measures reflect Census shipments adjusted for inventory change and intraindustry transfers, and deflated with appropriate price indexes (generally producer price indexes) at the most detailed level possible. The DIPS staff used the Census bridge tables in developing the historical NAICS output series. In measuring labor input the concept is hours paid; information on the relationship between hours worked and hours paid are not available at the detailed industry level. DIPS uses data on employment and average weekly hours from the BLS DCES for the period 1990 forward, and extrapolates these estimates back to 1987 using information supplied by DCES. For trade, transportation, and service industries where partners, proprietors and unpaid family workers play an important role, DIPS estimates the hours of these workers based on data from the CPS.

### **3. Other Areas Where Exploratory Research is Planned or Conceivable**

Many of the research ideas mentioned below are still exploratory in nature and, as such, the programs have not made specific commitments as to what results may be issued. Some possible projects are mentioned that are conceivable, but probably unfeasible. It does appear that the goal of having production accounts for about 65 industries back to 1973 (see Section I) may be obtainable if this research agenda were to be successfully completed. There are, however, significant concerns among program staff about the potential limitations of some of the data that may emerge.

Our informal interagency group discussed the possibility of converting historical benchmark input-output tables to NAICS. Such tables would be very useful because they would potentially increase the quality of industry output and intermediate input measures. However, creating such tables would take an enormous effort because the archival benchmark tables have different cell structures and do not reflect current national accounting conventions. There would undoubtedly be other difficulties and such extensive work may not be possible with available resources. Other efforts described in this section should meet many user needs in the area of outputs and intermediate inputs.

#### **BLS**

##### *Input-Output:*

The BLS Division of Industry Employment Projections (DIEP) has for many years maintained annual time series of historical input-output tables classified under SIC. The data they maintain are about 200 order. Their approach has been to use the most recent benchmark input-output table published by BEA as a starting point, to “collapse”

that to about 200 order, and then to estimate annual input-output tables for four to five years before and four to five years after the benchmark. The methodology for estimating annual tables adjusts the “collapsed” benchmark table to information from the most recently published National Income and Product Accounts. The DIEP uses these results in their employment projections model to forecast employment by occupation. The DIEP also has some “collapsed” tables for archival years. The tables have been made available to others, and have been an important source of information for multifactor productivity estimates by the BLS Division of Major Sector Productivity (DMSP) and for productivity estimates of researchers. It would be conceivable that the DIEP or some other agency program could use this type of approach to estimate NAICS tables for past benchmark years. The potential quality of such a product would be dependent on some of the other efforts described in this section.

*Major Sector Multifactor Productivity:*

The BLS DMSP has calculated multifactor productivity (MFP) for 2-digit SIC manufacturing industries back to the late 1940s. This includes published measures of output per combined unit of capital, labor, energy, nonenergy materials, and purchased business services (KLEMS) for manufacturing and corresponding research measures for nonmanufacturing industries within the business sector. Also, Gullickson and Harper [2002] conducted research that began to develop nonmanufacturing MFP measures. As part of this work, the BLS DMSP also has maintained measures of capital services for a complete set of 2-digit industries spanning the private business sector. The business sector capital service measures are also developed by aggregating this 2-digit detail,

which allows them to reflect interindustry shifts in capital. DMSP is in the process of converting this work to a NAICS basis. Based on released or soon-to-be released data from statistical agencies, private business measures will be constructed back to 1987. The quality of this data development effort and the availability of data prior to 1987 are quite dependent on the other research described in this section.

*Hours Worked:*

For many years the BLS Division of Major Sector Productivity (DMSP) has maintained estimates of hours worked for all persons at the two-digit SIC level. These hours estimates reflect employee hours paid from the BLS Current Establishment Survey, conversion ratios to hours at work from the Hours at Work Survey and Employment Cost Index and hours at work of farm workers, unpaid family workers and the self employed from the Current Population Survey. This datafile has been used by DMSP in its estimates of multifactor productivity (MFP) work for 2-digit SIC industries and were also used in. The file is also used in developing hours in both the quarterly output per hour data and the annual MFP data of DMSP. DMSP is engaged in exploratory research aimed at creating a similar file of hours worked for NAICS industries at the (corresponding) 3-digit NAICS level. This project is currently using mapping and linking techniques. The BLS is also doing exploratory research extend and improve industry hours series back in time before 1990.

*Detailed Industry Multifactor Productivity:*

The BLS DIPS is in the process of converting measures of MFP for detailed manufacturing industries to a NAICS basis. In addition to the 86 4-digit NAICS

manufacturing industries where conversion efforts are underway, DIPS also maintains multifactor productivity measures for railroad transportation and air transportation. Rail transportation was unaffected by the NAICS conversion and air transportation was developed on a NAICS basis. Note that the DIPS work is published in more detail than the NIPA industry structure.

### **Census Bureau: Reclassification Using Microdata from Historical Economic Censuses**

#### *Trade:*

Beginning in March 1999 the Census Bureau's Center for Economic Studies (CES) conducted research that reclassified each establishment in wholesale and retail trade in the 1992 Economic Census using micro data and the methodology described in Merrell and Klimek (2000). Working in the spring of 2005, CES has recast the 1992, 1997, and 2002 Economic Census microdata for these sectors on both NAICS 2002 and NAICS 1997 bases. This project will be completed when the 2002 Economic Census is completed in summer 2005.

#### *Manufacturing:*

The CES and the Board of Governors of the Federal Reserve System (FRB) are conducting a joint research project to construct NAICS-classified data for manufacturing using microdata from the Census of Manufactures. A preliminary description is available in Bayard and Klimek (2003), but another paper will be forthcoming in 2005 that will be more up-to-date and descriptive than the previous documentation. Some work remains, namely reclassification of the Annual Survey of Manufactures (ASM). While the micro

data approach still applies, sample weighting in the survey poses some potential problems for creating aggregate statistics on a NAICS basis.

*Future Longitudinal Business Database Focus:*

Future work on reclassification at CES will focus less on individual census years, and more on the Longitudinal Business Database (LBD). The LBD consists of longitudinally linked annual business register files with coverage of the universe of establishments that are in scope for the Economic Census. Prior projects should be incorporated into the LBD, and future projects should incorporate the LBD data and be recognized as the central repository for NAICS industry codes on historic data.

Using an establishment level approach, it will be possible to tabulate any of the variables that were collected in the Census, such as shipments, employment and investment. The Census Advisory Committee has recommended that the Census Bureau publish the aggregate statistics derived from these micro data research projects at CES. Resources have not been available to work on the dissemination of the data and progress is slow since there are no resources dedicated solely to this work at the Census Bureau or the Federal Reserve Board.

**BEA**

*Microdata Reclassification Work for Industries Other than Manufacturing and Trade:*

Recently, staff members of the BEA Regional and Industry programs have initiated a research study at the CES designed to classify establishments that are outside of manufacturing or trade on a NAICS basis. This work will initially focus on the 1997, 1992, and 1987 economic censuses. The BEA staff are beginning the process of

reclassifying certain data elements in these censuses from an SIC to a NAICS basis, using the same methodology as reported in Klimek-Bayard. Of course, once reclassified, the data can be aggregated to any level of geography and arrayed for any variable in the economic censuses, and should enable BEA to provide NAICS-based Gross State Product (GSP) by Industry estimates for 1987-97. By extending the reclassification effort to all industries, this work has strong potential to improve the quality of national level industry measures prior to 1998. Moreover, this work could prove useful if there were a future effort to convert BEA's historical benchmark input-output accounts to from an SIC to a NAICS basis.

*GDP by Industry before 1987:*

BEA is currently investigating options for providing NAICS-based GDP-by-industry estimates for years before 1987. Because the data that are available before 1987 do not support the full methodology that was used for 1987-97, BEA is considering simpler approaches that would provide a more limited set of data items for a long time period at fairly detailed industry levels. Trade-offs between the reliability of the estimates and the level of industry detail will need to be carefully evaluated. One option under consideration would provide estimates of nominal and real value added by industry back to 1959, but would not provide estimates of gross output and intermediate inputs by industry. These NAICS value added estimates would be useful for studying industry contributions to economic growth over long periods.

*Capital Data:*

BEA is presently evaluating its options for publishing historical NAICS-based estimates for investment, net stocks, and depreciation for years prior to 1987. These data are extremely important to the development of an historical production account. One option under consideration is to publish NAICS-based estimates back to 1959. These estimates were prepared using the same multi-step bridging process that was used to prepare the NAICS-based estimates that begin with 1987. Under this option, trade-offs between the reliability of the estimates and the level of industry detail will need to be carefully evaluated. BEA will continue to work closely with users of the capital data to identify additional issues and to better understand the impacts of the various publication options.

#### **4. Concluding Remarks**

Judging by customer inquiries, work by statistical agencies to create production accounts and work that transforms archival data to a NAICS basis may be valuable. The historical dimension of this work is akin to maintenance of old capital. The statistical agency programs that collect “raw” data are in the best position to convert their own tabulations to NAICS. It is their staffs who have knowledge of the data and who have access to historical microdata. Similarly, staff members of “downstream” programs, such as the BLS productivity program and the BEA programs, are in the best position to determine the sources of differences in their measures. Customer efforts to do similar work are likely to be less accurate. In addition, the program staff can provide a single or small number of estimates that many people can use, reducing spurious differences in analyses due to the way the conversion was handled.

We are seeking comments from FESAC members on the potential value and advisable scope of these types of efforts.

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## **Addendum: Questions for FESAC**

How critical is it to have data back prior to 1987?

Does the target of having 65 industries back to 1973 seem appropriate?

In most cases, the older data that we might be able to develop would not meet our quality standards for current information. If we were to publish older information, how should we think about the quality tradeoffs?

What could we do to improve upon the projects described here?

What additional projects might we consider to improve the set of data that will be available?