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Revolution in United States Government Statistics, 1926-1976

BY WILLIAM C. SHELTON

In late 1978 the Government Printing Office released a publication with the title of this article. It is the product of a joint effort by Joseph W. Duncan, Director of the Office of Federal Statistical Policy and Standards and me. It was undertaken as a bicentennial project with the basic text being completed in late 1976. Reviewed by outside observers and participants was completed in late 1977 and the final effort involved transferring the publication from the Office of Management and Budget (where it was initiated) to the newly created Office of Federal Statistical Policy and Standards in the Department of Commerce.

The historical review is actually part one of a two-stage effort which looked backward at the past 50 years (the subject of this article) and the next 10-12 years (*A Framework for Planning U.S. Federal Statistics for the 1980's*). The historical review is the product of an independent idea I suggested as early as June 5, 1972, which was supported by Duncan since he felt that such an effort would be useful as background for the *Framework*. (He had also just completed some historical work on the history of the planning and coordination function.)

The book was issued by the Office of Federal Statistical Policy and Standards at the end of November 1978. It has 257 numbered pages including a complete name index and a somewhat less complete subject index. It is entitled *Revolution in United States Government Statistics, 1926-1976*¹ because (1) it does not attempt to cover all subject-matter fields of Federal statistics but instead concentrates on the more revolutionary developments, and (2) as noted earlier, it was developed as a bicentennial effort to

concentrate on the last 50 years of statistical development within the broader context of the Nation's first two centuries. It is a history of ideas rather than events, and it treats the ideas in enough detail so that statisticians and the more serious users of statistics can understand both the simplicity of the basic concepts and at least some of the great complications involved in making these simple ideas practical. It gives considerable attention to the people who had these ideas and to the institutional framework through which the ideas were made effective. It leaves out many people who were very important in calculating and administering the statistics of the period but who were less important in the innovative process.

The authors, Joseph W. Duncan and I, have taken great pains in striving for (1) factual accuracy and (2) correctness of interpretation of major points. What makes us hopeful that there are no major errors is the really excellent cooperation that we have received from every important person from whom we have sought information. An informal committee of 9 persons (3 incumbent heads of statistical agencies, 3 retired heads, and 3 experts on particular subjects) met to review the plans and provided many helpful suggestions then and later, individually as well as collectively. There were 26 personal interviews, and more than 300 persons supplied information. About 100 persons reviewed extensive draft material, and many others reviewed sections.

The Four Themes of the Revolution

The book takes the position that there were four revolutionary changes in Government statistics during the 50 years: (1) probability sampling and its applications, (2) national income and product accounts (NIPA) and their uses, (3) mechanization and computers, (4) coordination and building of a statistical system.

¹ Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for \$4.50 a copy, Stock Number 003-005-00181-6.

A chapter is devoted to each theme. Most of the important developments in the last 50 years can be subsumed under one of these themes, but there are several which cannot. Accordingly, chapters 2, 3, 4, and 5 are devoted respectively to the four themes, and chapter 6 covers other developments. Chapter 1 is devoted to describing the full scope of Federal statistics in the period up to 1934, and introduces the revolutionary changes, and chapter 7 provides a look at the future to the extent that it is foreseeable on the basis of unfinished business and unfilled needs.

On the question of why and how the revolution took place, the book takes the position that (1) it was *possible* because theories and concepts had been developed, chiefly in the academic world, which could be applied, after further development, to the practical problems of government statistics; (2) it was *necessary* because the great depression, World War II, and other events brought about a greatly enlarged role for the Federal Government in the life of the Nation; and (3) it *actually did take place* because a relatively small group of statisticians, economists, and other professionals were assigned the responsibility to develop and improve the needed statistics and they succeeded in doing so.

An opposing view was put forward and stoutly maintained that the revolution was simply a response to the greatly increased need and demand for more and better statistics. Dr. Duncan and I rejected this explanation because it overlooks the supply-side factors. To consider a fairly clear supply-side phenomenon, the development of commercial television, it is nevertheless true that there is a great demand for television sets today and there was none 50 years ago. To consider a fairly clear demand-side phenomenon, the National park system, it would have been quite easy technologically to develop National parks 150 years ago, but it was not done because there was no demand by a rural society. Of course, any major innovation involves an increase in quantity both supplied and demanded. Nevertheless, in some cases (e.g., National parks) the ability to increase supply was always there and the major increase was due to an increase in demand. In other cases (e.g., television) the demand was always there even if latent, and the major increase was caused by a series of technological break-

throughs. In the case of Government statistics (and probably in most cases) both demand factors and supply factors clearly went through order-of-magnitude changes. Hence, we stuck with our formulation of why and how the revolution took place.

Returning to the question why the revolution was possible, it is an intriguing fact that the ideological roots of the revolution lie not only in statistics (probability theory, correlation, regression, etc.) but also in economics (national income theory and input-output) and even mathematics (Boulean algebra and matrices), electronics (flip-flop circuit and other developments leading to digital computers), and other social sciences (various management techniques and the principles of public administration). Increased professionalization has been the hallmark of the statistical revolution. In the 1920's, not only censuses but statistical studies of all kinds in the Federal Government were carried out by rather large numbers of clerks and clerical supervisors, directed more by administrators than by professionals. Statisticians and subject-matter professionals with formal statistical training were few in Government 50 years ago; they are numbered in the thousands today.

Federal Government Statistics up to 1934

The taking of a census at regular intervals for the apportionment of Representatives in Congress was a revolutionary idea in 1787 when it was written into the Constitution of the United States of America. In 1790 the United States became the first country in modern times to start taking a regular population census. In 1840, when several European countries were also taking regular population censuses, the United States added agriculture, mining and manufacturing to its decennial census and again had a claim to world leadership in censuses. In Government statistics other than censuses, however, this country lagged far behind a number of European nations until about the time of World War I. This was no doubt primarily because of the limited powers granted to the Federal Government.

World War I gave a fillip to Federal statistics especially in the fields of prices, manufacturing, agriculture and finance. By 1926, the starting point for the book, the output of Federal statis-

tics was highly relevant to public needs, and impartiality was rarely a problem. Quality and timeliness, however, were quite variable. When attention is shifted from statistical output to methods, coordination and uses, Government statistics were rudimentary or even primitive when judged by the standards of today. The Bureau of Agricultural Economics and the Federal Reserve Board were almost the only agencies doing any statistical analysis. Statistical methods were simply compilation, with a few intuitive samples. It is not accurate to speak of the Federal statistical system in this period because there was no coordination of the statistics of the various agencies.

The period from 1926 to 1933 was one of progress followed by challenge. The decennial census of 1929-30 was a high point and included the first census of distribution (trade, construction and selected services). After the stock market crash of October 29, 1929, Government economists and the Hoover Administration thought it necessary to reassure the public, and the following statement appeared on the inside front cover of the *Survey of Current Business*—

While it may be too early to say that the utilization of business data has entirely eliminated the business cycle, there is agreement today among business leaders everywhere that the wider use of facts will mitigate to a large degree many of the disastrous effects of the one-time recurrent business cycle.

Most business and economic statistics for the next 3 years were bad news, and there were challenges to impartiality, notably as regards unemployment, for which figures were either out of date or fragmentary. The Bureau of the Census and some other statistical operations were also adversely affected by the Economy Act of 1932.

The revolution in U.S. Government statistics really began in 1933, led by a group known as the Committee on Government Statistics and Information Services (COGSIS). COGSIS was organized in June 1933 and was active for 18 months. It was a private organization sponsored jointly by the American Statistical Association and the Social Science Research Council, and financed by the Rockefeller Foundation, but it was definitely a part of the Roosevelt New Deal. It grew out of an initiative by Secretary of Labor

Frances Perkins, and its services were offered to and accepted by the Secretaries of Agriculture, Commerce, Labor and Interior. There was a crisis atmosphere in Washington, and the leaders of COGSIS, Stuart A. Rice, Meredith B. Givens, Edmund E. Day and Frederick C. Mills, saw that they had a unique opportunity to (1) initiate badly needed statistical programs, (2) make solid improvements in existing programs, and (3) establish a small permanent agency to coordinate Federal statistics.

COGSIS achieved all three of these results, and two additional results turned out to be extremely important, eventually perhaps even more important than the three intended ones: (1) COGSIS provided professionally trained personnel to direct some of the operating statistical work of Federal agencies; (2) COGSIS stimulated research activities and innovative thinking which eventually had really revolutionary results in the development of the theory and applications of probability sampling, in establishing the national income and product accounts, and in greatly extending the use of analytical methods.

Probability Sampling and Its Applications

The theory of probability sampling went through four developmental phases before it was widely applied in the Federal Government: (1) the combination of observations, as set forth by Gauss, Laplace and others, (2) correlation, multivariate analysis and biometrics, as set forth by Karl Pearson and his followers, (3) small sample theory, as set forth by Gosset and R. A. Fisher, and (4) sampling from finite populations, as set forth by Jerzy Neyman and others. It was Neyman's article in the 1934 volume of the *Journal of the Royal Statistical Society*, giving the formula for minimum variance in stratified random sampling, which became the foundation article for Federal sampling work for the following decade.

There was little probability sampling in the Federal Government prior to 1933, the chief exception being in agricultural research. Beginning with the Civil Works Administration (CWA) Trial Census of Unemployment in three cities in 1933-34, a number of Federal agencies experimented with sampling of a probability nature. The 1937 Enumerative Check Census of Unemployment produced results which were

widely accepted. This led to the first really large-scale Federal use of sampling, namely, that in the 1940 population census. The Work Projects Administration (WPA) monthly Sample Survey of Unemployment began at almost the same time, and the Bureau of Labor Statistics-Bureau of Home Economics study of Family Spending and Saving in Wartime was carried out about 2 years later. By about the time the United States entered World War II, probability sampling was recognized as a valid method in the Government, and agencies were beginning to depend upon it.

More than any other one man, Calvert L. Dedrick began the introduction of sampling into the Bureau of the Census, but he left in early 1942. Morris Hansen succeeded Dedrick as chief of the Statistical Research Division, and he and William N. Hurwitz, acting as a team for 26 years, developed probability sampling methods applicable to surveys of establishments and households. Five of the major differences between the Hansen and Hurwitz methods and those in use by R. A. Fisher and his predecessors can be listed as follows: (1) they assume a finite population; (2) they make great use of ratio estimates instead of best linear unbiased estimates; (3) with stratification by size, they insist on complete coverage of large establishments; (4) they deal with sampling for multiple characteristics; and (5) they often use multistage sampling procedures. The methods were applied not only to one-time surveys such as censuses but also to current reporting systems. In 1953 Hansen and Hurwitz, along with William G. Madow, published a two-volume handbook of their methods entitled *Sample Survey Methods and Theory*. This book has spread the use of the sampling methods developed at the Bureau of the Census around the world.

After publishing this book, Hansen and Hurwitz went on to develop the control of total survey error, leading to the self-enumeration methods now used by Census. W. Edwards Deming moved from the Bureau of the Census to the Division of Statistical Standards in 1942 to hasten the spread of probability sampling to other Federal agencies. These various methods are now widely employed in dozens of Federal agencies, and the cost and time savings are obviously tremendous.

National Income and Product Accounts and Their Uses

It is only a slight exaggeration to say that the development and exploitation of the national income and product accounts (NIPA) have converted economics from the "dismal science" to a constructive instrument of national policy. Of course, economic principles were used in guiding national policy long before the NIPA existed—the debate on the repeal of the corn laws in the United Kingdom in the 1840's is a classic case—but the modern use of the national accounts to plan how big a war effort or economic development effort is feasible or how much fiscal stimulus is needed to return to full employment became possible only after the accounts were constructed with reasonably dependable and up-to-date statistics instead of with crude estimates.

The concept of national income was well established among academic economists by the late 19th century, and in the 1920's, the annual estimates prepared for the United States by Wesley C. Mitchell, Wilford I. King and others at the National Bureau of Economic Research (NBER) were fairly widely used. The work was turned over to Simon Kuznets in 1930. He spent the years 1931 and 1932 formulating the theory and establishing the methods to be used in computation, making use of the results of the censuses of 1930, which were in process of publication. Kuznets was also selected by the *Encyclopedia of the Social Sciences* to write their article on national income, which appeared in 1933 and became the theoretical foundation for the official estimates of the 1930's.

In June 1932, the United States Senate passed the La Follette resolution requesting the Secretary of Commerce to prepare estimates of the national income of the United States. Late that year arrangements were made for Kuznets to assume direction of this study on loan and for NBER to cooperate fully in the work. Kuznets spent the calendar year 1933 working part time at the Economic Research Division of the Bureau of Foreign and Domestic Commerce, where he directed a staff of three professionals and about six clerks. The report *National Income, 1929-32* was submitted to the Senate in January 1934 and printed as a Senate document. This report, giving annual figures for 4 years, was in considerable detail and well

documented. Robert R. Nathan became head of the national income work in December 1934. Under his direction, the annual estimates were improved, updated and broken down by State. More important for Government policy uses, monthly estimates of income payments were begun in 1938, representing a quantum jump in the timeliness of these statistics.

Milton Gilbert became chief of the National Income Division (NID) in the spring of 1941, after Nathan had moved to the defense agencies, and he began rethinking the national income concept to make it more significant in measuring and analyzing the current economic situation and outlook. He presented a paper at the annual meeting of the American Statistical Association in New York in December 1941, entitled *Measuring National Income as Affected by the War*. This article introduced into the United States the concept "gross national product at market prices" already used by J. R. Hicks in Great Britain. It gave estimates for the years 1939, 1940 and 1941 showing that GNP was about 25% larger than national income and it made clear why defense expenditures should be compared with GNP rather than with national income.

The President's budget of January 1942 for the fiscal year ending June 1943 was widely attacked as impossible, partly because of a lack of understanding of this point. Milton Gilbert wrote an article in the March 1942 *Survey of Current Business*, making the same conceptual points as in his ASA article and using forecasts for fiscal year 1943 developed by his cousin, Richard V. Gilbert of the Office of Price Administration. These estimates showed that the program was economically possible, and they turned out to be surprisingly accurate. In the January-March quarter of 1942, the War and Navy Departments applied to the War Production Board for substantial increases in program beyond the budget of January 1942. Donald Nelson, Director of WPB, assigned the feasibility question to the Planning Committee, of which Robert R. Nathan was chairman. With the help of Simon Kuznets, who studied the problem in national accounts terms, Nathan reported to Nelson that the increases were not feasible, and WPB informed the armed services that it was cutting back their requests and by how much. These wartime uses of national accounts were not only of tremendous help in the

war effort; they firmly established this framework as a foundation for Government economic policy.

It is not surprising, therefore, that when the Council of Economic Advisers was set up under the Employment Act of 1946, it was not long before the national accounts were receiving top billing. In the decade from 1945 to 1955 these accounts themselves were strengthened in many ways. The 1947 Supplement to the *Survey of Current Business* established the framework of the revised accounts, and the 1951 Supplement included a very usable and quite detailed discussion of sources and methods. The expenditure estimates were deflated to produce GNP in constant dollars. Size distribution of personal income was published in 1953. George Jaszi became chief of NID in 1952.

When Raymond T. Bowman became Assistant Director for Statistical Standards of the Bureau of the Budget in 1955, he established it as a principal objective that the national income and product statistics should assume a central position in Federal economic statistics. This principle promoted progress along two different lines: (1) the number of sets of statistics which were statistically integrated with the NIPA framework increased, and (2) the needs for NIPA carried increasing weight in determining what economic statistics should be collected and in what detail. During the ensuing decade, the following systems were integrated: balance of payments (1958), input-output (1964), flow of funds (1965). In addition, first results were published for a set of capital accounts, and the Federal Government budget was integrated in 1968.

Mechanization and Computers

The development and widespread use of the electronic digital computer unquestionably has been one of the great technological changes in the third quarter of the 20th century. The Federal statistical system, which had been the genesis of punch card equipment in the latter part of the 19th century, contributed a vital early step in the development of the computer. Punch card equipment affected statistics not only by reducing costs but by making multivariate analysis with masses of data practical almost for the first time. Computers have had far more influence on Government statistics and in a shorter time.

John W. Mauchly and J. Presper Eckert, Jr. built the first electronic digital computer which operated dependably, using a basic idea which Mauchly had gotten from John V. Atanasoff at Iowa State College. They did their work at Moore School of Electrical Engineering, a part of the University of Pennsylvania in Philadelphia, under contract with the Ordnance Department of the War Department. The first machine, ENIAC, took about 3 years (from early 1943 to early 1946) to design and build. ENIAC was designed to make thousands or even millions of calculations with a small amount of data. Mauchly was himself a statistician and met with Morris Hansen at Census to determine whether the machine could be adapted to Census needs, where relatively simple calculations are made from large masses of data. Hansen sought advice from the National Bureau of Standards (NBS) and others, and eventually decided to proceed.

Census established a working fund, and with this money NBS contracted with the Eckert-Mauchly Computer Corporation to design and to build UNIVAC I. In addition to improvements in the central processing unit, which was taken over from ENIAC, new auxiliary equipment had to be designed, including magnetic tape, a card-to-tape converter and a high-speed printer. By 1951 the UNIVAC system was being used profitably, but it was 1955 before all parts of the system were operating dependably. While it was going on, a decade seemed like a long time for development, but considering the number of new ideas which had to be developed it really was quite short. In fact the computer revolution in the United States, which developed from ENIAC and UNIVAC, has not only dwarfed the punch card revolution in extent but also in speed. In addition to Eckert and Mauchly, primary credit for the development of UNIVAC should go to Morris Hansen and James L. McPherson at Census and Samuel N. Alexander at NBS.

Automatic handling of input at Census has been almost as much of a revolution as has the computer, although FOSDIC and the automatic microfilming machine have not yet been widely used outside of the Bureau of the Census. Hansen started trying to mechanize the transfer of data from questionnaires to machine records shortly after World War II. After others had failed, M. Leighton Greenough of NBS suc-

ceeded in developing a workable mark-sensing machine which transfers data directly to magnetic tape. To make it practical, it requires an automatic microfilming machine. The model of this machine, 40 copies of which were used in the 1970 Census, was designed by and built under the direction of Anthony A. Berlinsky at the Engineering Development Laboratory at Census. The cost saving for these two machines is roughly estimated at \$5 million for the 1960 census and \$10 million for 1970 census.

Computers have led to the development of data systems and data banks. These concepts have already led to useful results, but they are still under development and will no doubt produce more rewarding results in the future. Computers are now used in almost every phase of statistical operations, from mailing lists and response control, to sample selection and estimating procedures, to editing and imputation, to tabulation and output. Uses of computers for analysis have also grown, and the Federal statistical system has contributed the notion of microdata sample tapes as well as the X-11, OMNITAB, and other analytical programs.

Coordination and the Building of a Federal Statistical System

The first even moderately effective coordination of Federal statistics—that is, melding the statistics of the various Federal agencies into a system—began in 1933 with the establishment of the Central Statistical Board (CSB). The most noteworthy abortive attempt before that time was the report of the Bureau of Efficiency in 1922, which recommended the establishment of a Federal Bureau of Statistics (built on the Bureau of the Census) with a substantial degree of centralization of statistical functions. This approach to the coordination problem was not supported by the statistical profession, and official action was not taken on it. The idea of a greater centralization continues to surface from time to time, however.

The Central Statistical Board was established under an Executive Order in 1933 on the recommendation of COGSIS, and it received statutory authority from Congress in 1935. It was quite effective in its first two years under Winfield W. Riefler with Morris A. Copeland as staff director. One of its most important contributions was to require (with White House

backing) the industry divisions of the National Recovery Administration to depend upon the Bureau of the Census and the Bureau of Labor Statistics for their overall statistics, thus assuring objectivity. Riefler had close contact with the White House, but after he left in 1935 and was replaced by Stuart A. Rice, the CSB gradually lost its clout, in spite of the fact that the quality of its professional work did not decline.

Two administrative and statutory actions restored the situation and firmly established coordination in Federal statistics. The first was the transfer of CSB to the Bureau of the Budget in 1939 when that bureau was transferred from the Treasury Department to the Executive Office of the President. This lent the power of the purse strings to the decisions of CSB. The second was the passage of the Federal Reports Act of 1942, which provided a statutory basis for the review of questionnaires and reporting forms. The name of the coordinating unit was changed to the Division (later Office) of Statistical Standards.

Rice remained as director until 1955, and in the immediate prewar and early postwar years, he gave major attention to international affairs of a statistical nature. Copeland moved to the National Defense Commission in 1940, and he and others helped DSS to keep order in the rapidly growing defense and economic statistics during World War II, in contrast to the overlapping and poor quality statistics of World War I. Raymond T. Bowman was Assistant Director for Statistical Standards in the Bureau of the Budget from 1955 to 1969. He emphasized economic statistics with the national income and product accounts as the centerpiece and was highly successful in this. When Federal priorities shifted to emphasize social objectives in the middle 1960's, he made some attempts to build up social statistics but was less successful in this field. Julius Shiskin was director from 1969 to 1973. He viewed the Office as having a broader function than that of setting statistical standards, and he obtained a name change to Office of Statistical Policy, which was changed to the Division of Statistical Policy after BOB became the Office of Management and Budget. Joseph W. Duncan became director in January 1974 after Shiskin had been appointed Commissioner of Labor Statistics, and he emphasized long-range planning.

The tools of statistical coordination, which have developed over a period of more than 40 years can be listed as follows: (1) organization of statistical activities, (2) changes in assignment of specific statistical programs, (3) publications for coordination, (4) standards and quality, (5) professionalism, quality of personnel and integrity, (6) forms review and confidentiality, (7) budget setting, (8) advisory committees and special study groups, (9) data banks, and (10) long-range planning. The growth in the use of these various tools has been quite uneven and there have been several setbacks. Nevertheless, the achievements of coordination over the whole period since 1933 are impressive, and a return by more than 50 agencies producing statistics to the do-it-yourself days of 50 years ago is unthinkable.

Other Significant Developments in Federal Government Statistics, 1933-76

Chapter 6 of the book treats four separate subjects: (1) new or vastly improved administrative statistics, (2) wider use of statistical analysis, (3) State and local area statistics, and (4) world uses of American statistical ideas.

Modern public administration generates for its own use masses of data from which statistics can be derived. It is the job of the statistician (1) to select for publication those statistics which can be useful for a broader audience, (2) to indicate some proper uses of them, and (3) to guard administrators and the public against misuse. Statistics derived from administrative documents differ fundamentally from directly collected statistics in that, being by-products of an administrative system, there is not the same degree of freedom to establish needs, coverage and definitions. Legal and operating requirements to an important degree determine the statistics available, and changes in laws and regulations cause discontinuities in these statistics over time which may be difficult or impossible to adjust. On the other hand, costs of producing administrative statistics are usually far less than for directly collected statistics, and the additional burden on respondents is small or nil. Hence, more complete and more detailed information can often be displayed.

The development of three major sets of administrative statistics is set forth. The Old-Age, Survivors, Disability and Health Insurance sys-

tem, stemming from the Social Security Act of 1935, not only provides totals of covered employment and of wages and salaries, but has also permitted the establishment of the Continuous Work History Sample. The totals are still a basic source of statistics in fine geographical detail; the latter is a gold mine of information on internal migration and for many special studies. *Statistics of Income* is the set of annual volumes derived from Federal income tax returns. The reports began in 1916, but as late as the early 1930's, only a small percentage of the population and a modest proportion of total income was covered. Now, however, coverage is very broad, and most parts of the NIPA are heavily dependent on this basic source. The financial statistics of individual corporations are required to be published according to regulations issued by the Securities and Exchange Commission, which was established in 1934. In contrast to nearly all other Federal statistics, which maintain confidentiality for individual reports, it is necessary for the financial condition of publicly traded corporations to be in the public domain so that investors and creditors can make intelligent decisions.

Under the wider use of statistical analysis, four developments are traced. Linear programming problems were being worked on in several places in years immediately after World War II, but it was George B. Dantzig in the U.S. Air Force who developed the simplex method to solve the general case. *Business Conditions Digest*, a publication of the Department of Commerce, presents current economic indicators in a framework which highlights usual timing relative to the business cycle and does this in a very timely and objective manner. It has had great success among government economists and in the financial community. The very instructive history of the relationship between smoking and health and the question of whether it is of a causal nature is also told. After years of controversy, the Advisory Committee to the Surgeon General wrestled with the problem for more than a year and in a report in early 1964 arrived at operating definitions of "factor," "determinant" and "cause." It concluded: "Cigarette smoking is causally related to lung cancer in men," and it went on to draw any other conclusions in the health field. The two issues of *Social Indicators* for 1973 and 1976 present societal assessments in charts and tables for a

number of subject-matter fields. The measures are mostly descriptive rather than analytic or programmatic. This reflects not only large gaps in needed statistics but also lack of professional agreement on the causes of social actions and the lack of an integrating framework comparable to the NIPA in economics.

Under State and local area statistics, 12 separate subjects are discussed. A considerable part of Federal statistics are collected through the States, and even where this is not the case, there has been a rapid growth in response to increased needs in the statistics available for States, cities, metropolitan areas, counties and even smaller units. For the most part, the cognizant Federal agency has provided geographical coordination, and there has been so far very little coordination across subject-matter fields except in a few States.

Under world uses of American statistical ideas, the point is made that before World War II the United States did not occupy a clearly preeminent position among the governments of the world as regards statistics. At the end of World War II, however, this country had much to give other governments on probability sampling from finite populations and on the accuracy, up-to-dateness and current use of national income and GNP. Within a decade after the war, we also had a computer system adapted to statistical uses. In the early postwar decades, technical assistance programs and other means were used to make this information fully available to all nations who expressed an interest. By now it is clear that the leadership gap which the United States opened up over other countries a generation ago has greatly narrowed.

Future Directions and Challenges for the U.S. Federal Statistical System

The final chapter provides the transition to the *Framework* for the 1980's. It distinguishes three types of statistical agencies, namely, those responsible for (1) coordination, (2) data collection and (3) data analysis. It points out that although great progress has been made in the economic field, much remains to be done, and it lists many of the outstanding problems. In the social field, it admits the relatively modest progress made so far, a fact partly resulting from the lack of an integrating theory comparable to NIPA in economics, and holds out the hope that

if the mid-decade census recently approved by Congress can become a coordinated mid-decade statistical effort with "nested surveys," there will be a better chance of creating a data base from which more integrated thinking can arise. It

closes by listing five keys to an integrated statistical system: (1) general-purpose data collection efforts, (2) policy committees, (3) technical interagency working groups, (4) public advice, and (5) a central policy agency.

Changes in the Presentation and Analysis of Price Movements at the Producer Level

BY CRAIG HOWELL

*Office of Prices and Living Conditions, Bureau of Labor Statistics
U.S. Department of Labor*

Since the late summer of 1977, the Bureau of Labor Statistics (BLS) has been making major changes in its presentation and analysis of price movements at the producer level. The change that has probably attracted the most attention has been the shift in emphasis away from the All Commodities Wholesale Price Index (WPI), which has been published since 1902. Indexes for other traditional commodity groupings, such as the Industrial Commodities Price Index, are also being deemphasized. In their place, BLS is now spotlighting the Finished Goods Price Index and other stage-of-processing (SOP) indexes, such as the intermediate materials and the crude materials price indexes. (BLS will continue to calculate and publish the All Commodities Price Index and other commodity grouping indexes.)

At the same time, the name of the Wholesale Price Index program has been changed to the Producer Price Index program. BLS believes that the term "Producer Price Indexes" more accurately reflects the coverage of these statistics. There is no change in the data being collected. These indexes continue to measure average changes in prices received in primary markets of the United States by producers of commodities in all stages of processing.

The name of the monthly BLS news release for these statistics became "Producer Price Indexes" when the March 1978 release was published in early April. The monthly detailed report, formerly known as *Wholesale Prices and Price Indexes*, was renamed *Producer Prices and Price Indexes* as of the March issue. Formats of the new release tables have been completely revamped, while the formats of the tables in the

detailed report have undergone somewhat less extensive alterations.

These changes in presentation have been made to ameliorate one of the major weaknesses in the previously featured All Commodities Index—that of multiple counting (or duplication) of price movements. This problem has long been recognized by professional economists both within BLS and elsewhere. One of the major reasons the Bureau initiated the stage-of-processing indexes more than a decade ago was to help solve this problem. A number of studies have documented this and other deficiencies in WPI methodology. One of the most recent and most systematic analyses was conducted by Dr. Richard Ruggles of Yale University for the Council on Wage and Price Stability.¹ BLS has begun the most comprehensive revision of producer price methodology in its history in order to deal with these problems effectively.²

Before describing the multiple-counting problem, it would be helpful to define the Bureau's stage-of-processing groupings to show how they differ from traditional commodity groupings. Many data users were apparently not familiar with the various SOP categories when they became the primary focus of the Bureau's presentation, even though the monthly news release and detailed report have included an

¹ Richard Ruggles, *The Wholesale Price Index: Review and Evaluation* (Washington, D.C., Council on Wage and Price Stability, 1977).

² See John F. Early, "Improving the Measurement of Producer Price Changes," *Monthly Labor Review*, April 1978, pp. 7-15.

analysis of price movements by stage of processing for more than a decade.

Each of the roughly 2,800 individual products included in the Producer Price Index system can be classified two ways: commodity groupings and stage-of-processing groupings. Commodity groupings organize products by similarity of end-use or material composition. In table

1, for example, we see that crude petroleum, jet fuel, and gasoline are all included in the commodity grouping for fuels and related products and power. Iron ore, finished steel mill products, and hand tools are part of the commodity grouping for metals and metal products. The transportation equipment grouping includes motor vehicle parts, passenger cars, and motor-trucks.

TABLE 1. PRODUCER PRICE INDEXES—EXAMPLES OF TWO CLASSIFICATIONS

| Commodity Classification | Stage-of-Processing Classification | | | |
|--|------------------------------------|--|--------------------------------------|---|
| | Crude | Intermediate | Finished | |
| | | | Consumer | Capital Equipment |
| Farm products, processed foods and feeds | | | | |
| 01 Farm products | Grain Livestock | | Fresh fruit Eggs | |
| 02 Processed Foods and Feeds | | Flour Refined sugar | Bread Meat | |
| Industrials | | | | |
| 03 Textiles and apparel | | Processed yarn | Apparel | |
| 04 Hides, skins, and leather | Hides and skins | Leather | Footwear | |
| 05 Fuels and related products | Crude petroleum | Jet fuel | Gasoline | |
| 06 Chemicals | Potash | Fertilizer | Soap | |
| 07 Rubber and plastic | Crude nat- ural rubber | Synthetic rubber | Tires | |
| 08 Lumber and wood | | Lumber | | |
| 09 Pulp and paper | Waste paper | Paper boxes | Sanitary papers | |
| 10 Metals | Iron ore | Finished steel mill products | | Hand tools |
| 11 Machinery | | Ball bearings Fluid power equipment Electronic com- ponents | | Agriculture machines Construction machines Electric generators |
| 12 Furniture and household durables | | | Household furniture Appliances | Commercial furniture |
| 13 Nonmetallic minerals | Sand Gravel | Flat glass Bricks | | |
| 14 Transportation equipment | | Motor vehicle parts | Passenger cars | Motortrucks |
| 15 Miscellaneous | | Photographic supplies | Toys Tobacco prod- ucts | Photographic equipment |

Under the stage-of-processing classification, on the other hand, products are organized according to the class of buyer and the degree of processing, manufacturing, or assembling to which products are subjected before they enter the market. There are three major SOP categories: finished goods; intermediate materials, supplies, and components; and crude materials for further processing. Finished goods are commodities that will not undergo further processing and are ready for sale to the ultimate user, either an individual consumer or a business firm. Capital equipment (formerly called producer finished goods) include commodities such as motortrucks, farm equipment, and machine tools. Finished consumer goods include foods, other nondurables, and durable goods eventually purchased by retailers and used by consumers. Intermediate materials, supplies, and components are defined as commodities that have been processed but require further processing before they become finished goods. Crude materials for further processing include products entering the market for the first time which have not been manufactured or fabricated but will be processed before becoming finished goods; scrap materials are also included.

Using the examples from table 1 previously cited, we see that gasoline, hand tools, passenger cars, and motortrucks appear in the finished goods category. Jet fuel, finished steel mill products, and motor vehicle parts are grouped together under intermediate materials. The crude materials category includes crude petroleum and iron ore.

Many products may be allocated to more than one stage-of-processing grouping. For example, while most gasoline is sold to individual consumers as a finished good, business firms also purchase gasoline as an intermediate product for their motor vehicle fleets. In such cases, the total weight of the commodity is distributed among the various SOP categories according to the relative proportion of output that can be classified at each level of processing. Such allocations are made at the subproduct class (6-digit) level within the commodity grouping structure. Since January 1976, input-output data from the 1967 Interindustry Sales and Purchases Study, conducted by the Bureau of Economic Analysis of the U.S. Department of

Commerce, have been used as the basis for these allocations.³

Stage-of-processing indexes are now being featured in the monthly presentation of price changes at the primary market level because the traditional commodity grouping indexes are "duplicated"—that is, they reflect the same price movement through all the various stages of processing. As a result of this multiple-counting problem, commodity grouping indexes sometimes produce exaggerated or misleading signals of price movements and are therefore less useful than the SOP indexes for analysis of general price trends.

A number of examples can be constructed from the products listed in table 1 to illustrate this point. Suppose that a price rise for wheat results in an increase in the price of flour and then an advance in prices of bread produced from that flour. The All Commodities Price Index and the Farm Products and Processed Foods and Feeds Index would reflect the same price movement three times—once for the bread, once for the flour, and once for the wheat. In contrast, the Finished Goods Price Index would reflect the changes in bread prices, the Intermediate Materials Price Index would reflect the flour price change, and the Crude Materials Price Index would reflect the rise in the price of wheat.

The multiple-counting problem arises because the current Producer Price Indexes use weights derived from gross shipment values reported in the Census of Manufactures or other sources. Gross shipment values, by definition, combine shipment values to other producers within a given industry with shipment values to buyers outside that industry. Economists have long argued that *net* output weighting should be used to construct price indexes "so that only the prices of the products leaving a given industry or sector are measured."⁴ Dr. Ruggles explains the inherent weakness of aggregate price indexes (such as the All Commodities index) which rest on a system of gross shipment weights.

³ For further information see "Wholesale Price Indexes by Stage of Processing," in *Wholesale Prices and Price Indexes, Supplement 1976, Data for 1975*, pp. 16-17.

⁴ Ruggles, *op. cit.*, p. 11-12.

The BLS wholesale price commodity index . . . includes commodities at many different levels of production, and the aggregate index is very much influenced by agricultural products and crude materials. . . . These agricultural products and crude materials . . . give a distorted view of price behavior for the economy as a whole. In an index of producers' prices it is indeed desirable to include price information on crude materials as well as finished products, but the weighting system used to obtain aggregate indexes should not permit these commodities to have an undue influence. The use of net output weights makes it possible both to provide the full amount of detail desired and to insure that the prices of commodities are correctly weighted at each level of aggregation.⁵

Over the next 5 years, the Producer Price Index Revision will implement the use of net output indexes for the first time. In the meantime, emphasis on the stage-of-processing indexes largely avoids the double-counting problem.

The threefold division of the stage-of-processing indexes among crude, intermediate, and finished goods may encourage the assumption that any price change at the crude materials level will be fully passed through to the intermediate materials level and will eventually appear within the Finished Goods Price Index. While such a sequence may frequently apply, it is not always the case. In the first place, market conditions may not allow a full pass-through of all increases in material costs when, for example, demand is weak or competition from substitute products is strong. In addition, increased productivity can sometimes absorb cost increases. In the second place, the commodities comprising the BLS stage-of-processing categories do not always fit into a crude-intermediate-finished progression. For example, a crude material may not be priced again until it shows up as a finished good; conversely, the crude material for an intermediate product may not be included in the sample used to compute the crude materials price index. As another example, the finished products made from some intermediate materials are not included in the Finished Goods Price Index.

Further analysis of the BLS stage-of-processing indexes can help avoid misinterpretations of the data.

Turning first to the stage-of-processing categories related to foods, one finds that the crude foodstuffs and feedstuffs index includes many items (such as livestock, live poultry, fluid milk, and green coffee) that are processed only once and thus are not priced again in the sample until they have become finished consumer foods (such as meats, processed poultry, dairy products, and roasted coffee). As a result, the index of intermediate materials for food manufacturing is calculated from a rather limited sample, consisting chiefly of flour, some fats and oils, refined sugar for food manufacturing, some beverage materials, and relatively small proportions of meats, dairy products, and processed fruits and vegetables. In the foods sector, then, the "normal" sequence is from crude directly to finished.

A somewhat different situation prevails among the stage-of-processing groupings for nonfood commodities. Here, the intermediate nonfood materials index includes many crucial industrial materials often described as "raw" or "basic." Examples include textile fabrics, industrial chemicals, synthetic rubber, lumber, paper, steel, and concrete. Such products have in fact already undergone some processing and therefore are classified among intermediate goods rather than crude goods. (Sometimes it has not been practical to obtain valid market prices for the crude versions of these intermediate materials; logs are one such case.) The sample of crude nonfood materials is therefore rather narrow. Its principal components are plant and animal fibers, some oilseeds, leaf tobacco, hides and skins, coal, natural gas, crude petroleum, crude natural rubber, wastepaper, iron ore; scrap metals, and sand, gravel, and crushed stone. But in spite of its limited scope, the crude nonfood materials index deserves close attention because these prices are unusually sensitive to shifts in supply and demand factors. The Bureau of Economic Analysis is using a slightly different index (namely, crude nonfood materials excluding plant and animal fibers, oilseeds, and leaf tobacco) as one of the 13 leading indicators of the state of the general economy.

While the crude nonfood materials index is characterized by sharp upward or downward

⁵ *Ibid.*, p. 11-14.

movements that frequently reverse directions, the behavior of the intermediate nonfood materials index is much less volatile. The latter index may therefore be a better indicator of future price changes for finished goods excluding foods. Interpretation of the movements of the intermediate nonfood materials index is complicated by two factors.

First, unlike the indexes for crude materials or for finished goods, the index for intermediate materials has its own double-counting problem. This situation arises because there are several levels of processing that are all classified by BLS as intermediate. For example, a rise in the price of raw cotton would appear once in the crude materials price index, several times in the intermediate materials price index (to reflect whatever pass-through there would be for, say, cotton yarns, gray fabrics, and finished fabrics), and once in the Finished Goods Price Index (for apparel).

And second, price changes for intermediate construction materials need not be reflected later in the Finished Goods Price Index, because finished construction projects such as new houses or factories are excluded from the universe of prices sampled for the Finished Goods

Price Index. Only finished goods from the agricultural, mining, and manufacturing sectors are included in this universe. Construction materials themselves are included in the intermediate materials grouping because they are outputs of mining and manufacturing. Although prices of new houses are not included in the Finished Goods Price Index at the primary market level, they are included in the Consumer Price Index, another major price index program of BLS.

By shifting its focus towards analysis by stage-of-processing groupings, BLS has tried to contribute to an improved comprehension of the process of price changes in the contemporary American economy. Reactions to the new analytical emphasis from data users in government agencies, business firms, labor unions, academic institutions, consulting groups, and elsewhere have generally been favorable. The only major reservations that have developed so far have come from those who have contracts with escalator clauses tied to the All Commodities index or other traditional commodity grouping indexes. Even most of these problems have been resolved when users learn that these indexes will continue to be available.

The Domestic Information Display System

BY MARTHA WYETH

Bureau of the Census, U.S. Department of Commerce

It's not sweeping across the Nation like jogging, or catching the attention of department heads in the same way Civil Service reform or a hiring freeze does, but a new application of existing technology has gained the respect of many officials—from policy analysts and mayors to the President of the United States.

On a medium familiar to all of us—a TV screen—color choropleth maps at either National, State, county, or city levels, depict Federal data ranging from unemployment and population change to fish killed by pollution. This project, called the Domestic Information Display System (DIDS), resulted from a cooperative effort by the National Aeronautics and Space Administration (NASA), the Bureau of the Census, and the White House to improve the quality, quantity, and timeliness of information for decisionmaking in the White House and Capitol Hill. A prototype system was developed using a special-purpose NASA computer and in June 1978 demonstrations were held at both the Capitol and the White House. At that time reaction was so favorable that further efforts to study the merits of the system were consummated in a one year follow-on project.

The system's potential took shape by mid-September when 15 Federal agencies agreed to participate in a shared-cost arrangement to do further research, evaluation, and demonstration of DIDS. The participating agencies include the Department of Agriculture; Bureau of the Census, Economic Development Administration, and National Oceanic and Atmospheric Administration (NOAA), all of the Department of Commerce; the Community Services Administration; the Department of Energy; the Environmental Protection Agency; the Department of Health, Education, and Welfare; the Department of Housing and Urban Development; the U.S. Geological Survey of the Department

of the Interior; the Department of Justice; the Bureau of Labor Statistics; the Departments of Transportation and Treasury; and the Veteran's Administration. The NASA Goddard Space Flight Center houses the system, and its personnel provide extensive technical support to agency users who access the system and maintain the computer hardware, software, and data storage facilities.

To facilitate system operation, a number of arm of DIDS is the Steering Committee which is made up of representatives from each of the funding agencies, the Congress, and the White House. The Steering Committee is co-chaired by Joseph W. Duncan, Director of the Office of Federal Statistical Policy and Standards, and Ed Zimmerman, Special Assistant to the Director, Office of Administration, Executive Office of the President. An Evaluation Committee will determine if the objectives were met and if the efforts merits further funding and expansion. The objective of the follow-on effort is to determine the value of geographical and other supporting visual displays with a wider variety of existing data bases as an aid to analysts and policymakers through conversational access.

Criteria for evaluation include the following:

1. What examples of improved analysis can be accomplished using the display and map correlation capabilities of the system?
2. What types of publications, reports, and other policy or decisionmaking instruments were improved as a result of the experimentation permitted by the system's capability to vary color, geography scaling, and other factors?
3. What is the relative cost of loading and analyzing data bases on this system compared with existing baseline systems using

individual agency data bases and is it cost effective?

4. What are the time lags involved between the identification of an issue to be analyzed and the presentation of the final analysis, using present baseline systems? What impacts would the prototype DIDS have on these lags? What improvements might be predicted for an operational DIDS?
5. What non-agency use of particular data bases is identified through the system? (A log will be kept of all of the uses of data bases.)
6. How does the system improve the process of analysis, evaluation and delivery of information for policymaking?

Initially Census Bureau summary data from the 1972 and 1977 *County and City Data Book*, and 15 selected Standard Metropolitan Statistical Areas (SMSA's) from the *Urban Atlas* series appeared on the system. Since then the Bureau of Labor Statistics, the Environmental Protection Agency, the Community Services Administration, and Treasury have added files which identify updated employment and unemployment data, fish killed by pollution, Federal outlays and grant dollars, and salary disparities among men, women, and minorities. One critical issue being addressed by the Technical Committee is that of the location of remote terminals at key locations in downtown Washington, D.C. With the system housed at Goddard, several miles from most other Federal agencies, the importance of availability to large numbers of policymakers is paramount.

Even as this article goes to print the Subject Area Users Committee, chaired by Robert L. Chartrand, a senior specialist in information sciences at Congressional Research Service, and the Analytical Committee, chaired by Warren G. Glimpse, Assistant Chief, Data User Services Division, Bureau of the Census, are meeting with their committees to identify key issues which can serve as prototype policy analysis. All three

sectors of the project—the participating agencies, Executive Office of the President, and Congressional Research Service are identifying in addition to issues, resource persons, issue briefs, congressional bills, committees, documentation, and analysts, who will work on the analysis.

Even in its infancy, DIDS has produced success stories. At a meeting of the U.S. Conference of Mayors Task Force on Balanced Growth, attending mayors received a presentation on the geo-display of socioeconomic data relevant to aspects of urban policy. They were quite impressed with the information products they received. For the first time they were able to graphically view their similarities and differences, and thus to find common ground for quick policy analysis.

The Department of the Treasury experienced an even more significant display of data when officials viewed a map that revealed a relatively small number of States with a very high percentage of their population eligible for participation in a proposed program, while a relatively large number of States had a very low percentage of their population eligible. The display suggested that, unless the eligibility criteria were modified to provide for more extensive coverage, a proposed piece of legislation to establish eligibility criteria and formulae, would face insufficient backing in Congress.

This is only the beginning. As agencies add data files and analysts view its potential, DIDS could streamline Federal policymaking. Because of the one year follow-on project, the Steering Committee welcomes input and inquiries from data users. For further information, please contact the DIDS secretariat at the following address and phone number.

Martha Wyeth
U.S. Bureau of the Census
Data User Services Division
Room 3069-3
Washington, D.C. 20233
Telephone: (301) 763-5483

CURRENT DEVELOPMENTS

FRB CONSUMER INSTALMENT CREDIT RELEASE REVISED

The Federal Reserve has revised its statistical release on consumer instalment credit 421 (G.19) due to conceptual and statistical changes in the series. All estimates in the October 1978 release, published December 7, 1978, incorporate revisions based on: (1) new bench mark information for all holder groups; (b) elimination of a previous arbitrary adjustment—affecting commercial banks, mutual savings banks, and savings and loan associations—that was designed to remove certain credit used by households for business or other nonconsumer purposes; (c) the addition—beginning in 1971—of open-end credit held by the large petroleum marketing companies through gasoline credit cards used by individuals, as noted earlier; and (d) the addition—beginning in 1977—of some retailer-held credit, formerly classified by the Census Bureau as noninstalment, that has been reclassified as instalment. Some holders of certain types of credit are identified separately for the first time, while other credit types—formerly shown separately—are combined into broader categories.

Revised monthly estimates, in the same format as in the "421" release, are available for the period January 1943 through September 1978. Contact Lois Lawrence, Mortgage and Consumer Finance Section, Division of Research and Statistics, Board of Governors of the Federal Reserve System, Washington, D.C. 20551. (JAMES A. PFLUEGER, DIVISION OF RESEARCH AND STATISTICS, FEDERAL RESERVE BOARD, telephone (202) 452-2540.)

IMPROVING MONETARY AGGREGATES

Improving the Monetary Aggregates: Staff Papers contains certain of the research papers that had been prepared by the staff of the Federal Reserve Board for use of the Advisory Committee on Monetary Statistics. The Advisory Commit-

tee had been appointed in early 1974 to provide a technical evaluation of, and a report on, the quality of the monetary aggregates used by the Federal Reserve in the formulation and implementation of monetary policy. The Committee agreed that the staff papers when published could be revised provided the final versions contain essentially the same information that had been made available to the Committee during the course of its deliberations. The Committee also requested further investigation of its tentative proposal for an alternative method of calculating *M-1* and a paper presenting this further work is included in the volume.

Copies of the *Staff Papers* may be obtained from Publications Services, Division of Administrative Services, Board of Governors of the Federal Reserve System, Washington, D.C. 20551. The price is \$4.00 per copy; in quantities of 10 or more sent to one address, \$3.75 each. (EDWARD C. ETTIN, OFFICE OF STAFF DIRECTOR FOR MONETARY AND FINANCIAL POLICY, FEDERAL RESERVE BOARD, telephone (202) 452-3762.)

FRB ANNUAL STATISTICAL DIGEST

The *Annual Statistical Digest, 1973-1977* is designed as a compact source of economic—and especially financial—data. The object is to lighten the burden of assembling time series by providing a single source of historical continuations of the statistics carried regularly in the Federal Reserve *Bulletin*. The *Digest* also offers, at least once a year, a continuation of series that formerly appeared regularly in the *Bulletin*, as well as certain special, irregular tables, which the *Bulletin* also once carried. The domestic nonfinancial series included are those for which the Board of Governors is the primary source.

This issue of the *Digest* covers in general the years 1973 through 1977. It serves to maintain the historical series first published in *Banking and Monetary Statistics, 1941-70*, and continued

with the first two issues of the *Digest*—for 1971-75 and 1972-76.

Copies of the *Digest* are available from Publications Services, Division of Administrative Services, Board of Governors of the Federal Reserve System, Washington, D.C. 20551. The price is \$12.00 per copy. (DOREEN DIPRE, DIVISION OF RESEARCH AND STATISTICS, FEDERAL RESERVE BOARD, telephone (202) 452-3567.)

FRB BANK HOLDING COMPANY REPORT

The Federal Reserve Board recently issued a report entitled *The Bank Holding Company Movement to 1978: A Compendium*. This study by the Board's staff reviews the available published research on those aspects of bank holding company activity that are relevant to public policy. It covers the following topics: background history of the movement and Federal regulation; internal operations, including efficiency and performance reviews; implications of growth for safety and soundness; effects on competition and on concentration of banking and financial resources; and public benefits from the expansion of bank holding companies and implications for community convenience and needs.

Copies of the *Compendium* are available from Publications Services, Division of Administrative Services, Board of Governors of the Federal Reserve System, Washington, D.C. 20551. The price is \$2.50 per copy; in quantities of 10 or more sent to one address, \$2.25 per copy. (ROBERT A. EISENBEIS, DIVISION OF RESEARCH AND STATISTICS, FEDERAL RESERVE BOARD, telephone (202) 452-2605.)

SELECTED CHARACTERISTICS OF TRAVEL TO WORK IN 20 METROPOLITAN AREAS: 1976

This Bureau of the Census report is the second in a series on commuting behavior from the Travel-to-Work Supplement to the Annual Housing Survey, initiated in 1975 under the sponsorship of the U.S. Department of Transportation.

Topics covered include major mode of transportation to work, incidence of carpooling, recent changes in major mode, satisfaction with major mode, and the length and duration of commuting trips. The findings also include a comparison between public transportation use in 1976 and 1970.

Copies of the report, "Selected Characteristics of Travel to Work in 20 Metropolitan Areas: 1976," *Current Population Reports*, Series P-23, No. 72 (27 pp., \$1.40) may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (PHILLIP A. SALOPEK, BUREAU OF THE CENSUS, DEPARTMENT OF COMMERCE, telephone (301) 763-5226.)

RACIAL SUCCESSION IN HOUSING PUT AT FOUR PERCENT

About 4.0% of housing turnovers in the United States during the period 1967-71 involved racial succession, according to a new Bureau of the Census report entitled *Racial Succession in Individual Housing Units*. About 3.1% of occupancy changes involved Blacks replacing Whites, and 0.9% involved Whites replacing Blacks.

The probability that racial succession will accompany a housing turnover was found to be higher in the North than in the South and higher in central cities than suburbs (but higher in suburbs than in nonmetropolitan areas). Blacks moving into housing units previously occupied by Whites tend to cover short distances in their moves, are of higher socioeconomic status than other Black movers, and typically consist of families in which both husband and wife are present. The Whites who are replaced by Blacks tend to be older and of lower socioeconomic status than other White movers.

The data show that Black husband-wife couples with children lead the way in replacing White households. Black households who replace White households appear to have annual incomes that, on the average, approximate those of the Whites who are replaced.

The study provides the first opportunity to compare on a nationwide basis the successive occupants of housing units. The data come from matched overlapping panels of Current Population Surveys conducted in March 1967 through March 1971. Four sets of year-to-year matches (1967 and 1968, 1968 and 1969, 1969 and 1970, and 1970 and 1971) yielded 9,264 household successions.

Racial Succession in Individual Housing Units was published as *Current Population Reports*, Series P-23, No. 71 (19 pp., \$1.20). Copies are for sale by the Superintendent of Documents,

U.S. Government Printing Office, Washington, D.C. 20402. (LARRY H. LONG, BUREAU OF THE CENSUS, DEPARTMENT OF COMMERCE, telephone (301) 763-5846.)

CHANGES IN FARM PRODUCTION AND EFFICIENCY, 1977

USDA Statistical Bulletin No. 612 entitled *Changes in Farm Production and Efficiency, 1977* was issued in November 1978. This publication contains data for 1910 through 1977 for the major statistical series on farm production, inputs and efficiency expressed as indexes. It also provides in one place the latest information for appraising changes in production, changes in farm inputs and practices, improvements in labor productivity and progress in farm mechanization. Data are given for the 10 farm production regions and the United States (DONALD D. DUROST AND EVELYN T. BLACK, ECONOMICS, STATISTICS, AND COOPERATIVES SERVICE, DEPARTMENT OF AGRICULTURE, telephone (202) 447-6620.)

RURAL DEVELOPMENT PERSPECTIVES

A new publication series entitled *Rural Development Perspectives* has been instituted by the Economics, Statistics, and Cooperatives Service of the Department of Agriculture. The new series seeks to improve the communication of research findings helpful in making decisions that affect the growth and development of rural America. Data used come from a variety of sources representing the most current information available. A concise, semitechnical writing style was selected.

Articles in the first issue, now available, include "Making a Living in Rural and Smalltown America," "Rural Housing: Progress and Problems," and "Women in the Rural Labor Force." Most statistical data are graphically portrayed. Single complimentary copies are available. (DAVID L. BROWN, ECONOMICS, STATISTICS, AND COOPERATIVES SERVICE, DEPARTMENT OF AGRICULTURE, telephone (202) 447-8866.)

HOUSING CREDIT: A RURAL-URBAN COMPARISON

Rural Development Research Report No. 6 has recently been issued by the U.S. Department of Agriculture. This publication shows that the availability of home mortgage credit in rural areas is much less than in urban communities.

The major reason is the limited number of savings and loan associations operating in rural areas. Although the Farmers Home Administration is active in rural areas, commercial banks are the major source of rural housing credit.

The study focused on rural areas and used data furnished by commercial banks and savings and loan associations for December 31 of the years 1972 through 1975. Farmers Home Administration data are for loans outstanding on June 30, 1975. Data for commercial banks were obtained from the Federal Reserve Board; for S&L's, from the Federal Home Loan Bank Board and other sources, and for the Farmers Home Administration from their records. These years were selected because they portrayed marked changes in economic conditions and monetary policy. Data were analyzed on the basis of urbanization and rurality of counties. The counties were divided into four groups, those in an SMSA with at least 1 million population, SMSA counties with a population between 50,000 and 999,999, nonmetro counties with a city population of 2,500 to 49,999 and totally rural counties with no city population of more than 2,500. (HUGHES H. SPURLOCK AND RONALD BIRD, ECONOMICS, STATISTICS, AND COOPERATIVES SERVICE, DEPARTMENT OF AGRICULTURE, telephone (202) 447-8717.)

RECENT UN STATISTICAL OFFICE PUBLICATIONS

Some recent publications of the United Nations Statistical Office are briefly described below. Copies of these documents may be purchased from the Sales Section, United Nations, New York, New York 10017. Government agencies should request the discount to which they are entitled, as it is not automatically given.

Statistics of Internal Migration: a Technical Report (Studies in Methods, Series F., No. 23, 45 pp., UN Sales No. E.78.XVII.13, \$4.00).—In 1972, the United Nations Statistical Commission considered proposals for possible guidelines on statistics of internal migration. While the Commission felt that "the need for, and possibilities of, international comparability were not as great in the case of internal migration statistics as in that of international migration statistics," it nevertheless considered that "the sharing and distillation of national experience and views in the form of international guidelines would be of value to countries in developing their internal

migration statistics." Revised proposals, based in part on the provisional results of a study of national practices, were considered by the Commission at the 1976 session. The Commission concluded that the wide diversity of national needs and practices made it difficult to formulate recommendations but requested that the proposals be revised and be issued, together with the final results of the study of national practices, as a technical report for the information of Member States and others.

The present report is intended to help countries in collecting and analysing statistics of internal migration and to provide information on current national practices. It contains information on the needs of such statistics, the uses of the data, the definition of internal migration, the sources of data and the collection, tabulation and publication of data on the characteristics of internal migrants.

Yearbook of Industrial Statistics, 1976 edition Vol. I, General Industrial Statistics (Statistical Papers, Series P, No. 14 (Vol. I), xi + 703 pp., UN Sales No. E.78.XVII.3E, \$30.00; *Vol. II Commodity Production Data, 1967-1976* (Statistical Papers, Series P, No. 14 (Vol. II), viii + 728 pp. UN Sales No. E.78.XVII.4., \$30.00).—This is the tenth in a series of annual compilations of industrial statistics. Volume I contains data for 105 countries. The following items are covered for each branch of industry: number of establishments; employment; compensation of employees; hours worked by operatives; quantity of electricity consumed; gross output; value added; gross fixed capital formation; value of stocks; and index numbers of industrial production. In addition, special tables are included on the growth of industrial production and employment in the major regions and in the world as a whole.

Volume II presents information on production in about 200 countries of selected industrial commodities in the years 1967-1976. Quantity data for a standard list of 535 commodities were collected by questionnaire from all major developed countries and most of the developing ones. The series are shown on a commodity-by-country basis and are arranged according to the International Standard Industrial Classification (ISIC) industry groups of which the commodities are principal products. All branches of mining and manufacturing are represented.

Yearbook of Construction Statistics, 1967-1976 (Statistical Papers, Series U, No. 5., 296 pp., UN Sales No. E.78.XVII.12., \$18.00).—This is the fifth issue in a series of annual compilations of statistics on construction activity. Data are presented for 120 countries or areas. The national tables contain, in general, two different sets of data. The first are estimates from annual surveys of units engaged in construction. The second are derived from information collected by local authorities for regulatory or control purposes. The following items are covered: general indicators of activity, fixed assets, permits authorized for building and dwelling construction and building construction and dwellings completed. In addition, an international table is included on index numbers of construction activity by countries.

United Nations Statistical Pocketbook (World Statistics in Brief) (Statistical Papers, Series V, No. 3, x + 241 pp., UN Sales No. E.78.XVII.9, \$3.95).—This is the third in a series of annual compilations of basic international statistics. The compilation was undertaken in response to General Assembly resolution 2626 (XXV), in which the Secretary-General was requested, *inter alia*, to supply adequate basic national data that would increase international public awareness of countries' development efforts. It is hoped that the *Pocketbook* will serve as an appropriate vehicle for disseminating, in compact form, important basic facts relating to various countries.

The data were selected from the wealth of international statistical information compiled regularly by the Statistical Office of the United Nations, the statistical services of the specialized agencies and other international organizations. Part One of the *Pocketbook* has a separate page for each of 150 countries, showing important and frequently consulted statistical indicators. Part Two contains demographic, economic and social statistics for the world as a whole, selected regions of the world and major countries.

This *Pocketbook* generally covers the years 1965, 1970, 1975 and 1976. The statistics included for each year are those most recently compiled and published by the United Nations and the specialized agencies. The aim is to present for the various countries, over the period covered, time series that are as nearly comparable as the available statistics permit.

It is intended that this publication should have a wide general distribution throughout the world. It should be of special interest to students, the business world and the interested

general reader. The compact size of the *Pocketbook* (5¼" × 7¾") makes it easily portable and easily stored in the home library.

PERSONNEL NOTES

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

Division of Research and Statistics: WARREN COATS, an Economist with the International Monetary Fund, has joined the Board's staff in the Banking Section as a Visiting Professor for a one-year assignment.

MICHAEL CRUPE, Ph.D. candidate from the University of Wisconsin, has joined the Board's staff as an Economist in the Banking Section.

SAMUEL SLOWINSKI, formerly with the Federal Deposit

Insurance Corporation, has joined the Board's staff as a Statistician in the Econometric and Computer Applications Section.

EDWARD C. ETTIN, formerly an Associate Director in the Division of Research and Statistics, has been transferred and promoted to Deputy Staff Director in the Office of Staff Director for Monetary and Financial Policy.

THOMAS SIMPSON, formerly an Economist in the Banking Section, has been promoted to Senior Economist in that Section.

SCHEDULE OF RELEASE DATES FOR PRINCIPAL FEDERAL ECONOMIC INDICATORS

February 1979

Release dates scheduled by agencies responsible for the principal economic indicators of the Federal Government are given below. *These are target dates* that will be met in the majority of cases. *Occasionally agencies may be able to release data a day or so earlier or may be forced by unavoidable compilation problems to release a report one or more days later.*

month covering release dates for the following month. The indicators are identified by the title of the releases in which they are included; the source agency; the release identification number where applicable; and the *Business Conditions Digest* series numbers for all BCD series included, shown in parentheses. Release date information for additional series can be found in publications of the sponsoring agencies.

A similar schedule will be shown here each

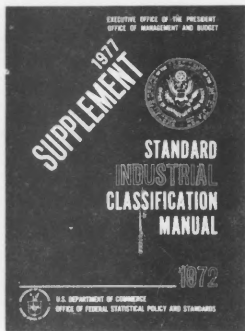
(Any inquiries about these series should be directed to the issuing agency.)

| <i>Date</i> | <i>Subject</i> | <i>Data for</i> |
|-------------|--|------------------------|
| February 1 | Construction Expenditures (Press release), Census, C-30 (69) | December |
| 1 | Merchandise Trade, Balance of Payments Basis, Bureau of Economic Analysis (BEA) (618, 620) | 4Q'78 |
| 1 | Money Stock Measures, Federal Reserve Board (FRB), 508 (formerly H.6) (85, 102, 107, 108 | Week Ending January 24 |
| 1 | Factors Affecting Bank Reserves and Condition Statement of Federal Reserve Banks, FRB, 503 (formerly H.4.1) (93, 94) | Week Ending January 31 |
| 2 | The Employment Situation (Press release), BLS (1, 3, 21, 37, 40-44, 91, 340, 442, 444-448, 461-452 | January |
| 6 | Consumer Credit, FRB, 421 (formerly G.19) (66, 113) | December |
| 6 | Manufacturers' Export Sales and Orders, Census, M4-A | December |
| 6 | Open Market Money Rates and Bond Prices, FRB, 415 (formerly G.13) | January |
| 7 | Condition Report of Large Commercial Banks, FRB, 504 (formerly H.4.2) (72, 112) | Week Ending January 31 |

| <i>Date</i> | <i>Subject</i> | <i>Data For</i> |
|-------------|--|--------------------------|
| February 7 | Monthly Wholesale Trade (Press release), Census, BW | December |
| 8 | Money Stock Measures, FRB, 508 (formerly H.6) (85, 102, 107, 108) | Week Ending January 31 |
| 8 | Factors Affecting Bank Reserves and Condition Statement of Federal Reserve Banks (FRB), 503 (formerly H.4.1) (93, 94) | Week Ending February 7 |
| 9 | Crop Production, Agriculture | February 1 |
| 9 | Advance Monthly Retail Sales (Press Release), Census (54) | January |
| 9 | Producer Price Indexes (Press release), Bureau of Labor Statistics (BLS) (330-334) | January |
| 12 | Supply Demand Estimates, Agriculture | Current Marketing Season |
| 14 | Condition Report of Large Commercial Banks, FRB, 504 (formerly H.4.2) (72, 112) | Week Ending February 7 |
| 15 | Food Assistance Program Results, Agriculture ... | December |
| 15 | Industrial Production and Related Data, FRB, 414 (formerly G.12.3) (47, 73-76) | January |
| 15 | Manufacturing and Trade: Inventories and Sales, BEA (31, 56, 71) | December |
| 15 | Yields on FHA Insured New Home 30-Year Mortgages, HUD (118) | February 1 |
| 15 | Money Stock Measures, FRB, 508 (formerly H.6) (102, 107, 108) | Week Ending February 7 |
| 15 | Factors Affecting Bank Reserves and Condition Statement of Federal Reserve Banks, FRB, 503 (formerly H.4.1) (93, 94) | Week Ending February 14 |
| 16 | Housing Starts (Press release) Census, C-20 (28, 29) | January |
| 16 | Output, Capacity, and Capacity Utilization, FRB, 402 (formerly G.3) (82, 84) | January |
| 16 | Personal Income, BEA (223) | January |
| 21 | Gross National Product (Revised), BEA (200, 205, 210) | 4Q'78 |
| 21 | Condition Report of Large Commercial Banks, FRB, 504 (formerly H.4.2) (72, 112) | Week Ending February 14 |
| 22 | Advance Report on Durable Goods, Manufacturers Shipments and Orders (Press release), Census, M3-1, (6, 24, 25, 96, 548) | January |
| 22 | Money Stock Measures, FRB, 508 (formerly H.6) (85, 102, 107, 108) | Week Ending February 14 |

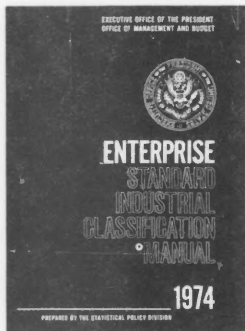
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|-------------|---|-------------------------|
| February 22 | Factors Affecting Bank Reserves and Condition Statement of Federal Reserve Banks, FRB, 503 (formerly H.4.1) (93, 94) | Week Ending February 21 |
| 23 | Consumer Price Index, BLS (320, 322) | January |
| 23 | Real Earnings, BLS (341) | January |
| 23 | Average Yields of Long-Term Bonds, Treasury Bulletin (115, 116) | December |
| 27 | Productivity and Costs in Nonfinancial Corporate Sector, BLS (63, 358, 370) | 4Q'78 |
| 28 | Composite Indexes of Leading, Coincident, and Lagging Indicators (Press release), BEA | January |
| 28 | Work Stoppages (Press release), BLS | January |
| 28 | Agricultural Prices, Agriculture | Mid-February |
| 28 | Export and Import Merchandise Trade, Census, FT-900 (602, 612) | January |
| 28 | Labor Turnover in Manufacturing (Press release), BLS (2, 3, 4) | January |
| 28 | Condition Report of Large Commercial Banks, FRB, 504 (formerly H.4.2) (72, 112) | Week Ending February 21 |

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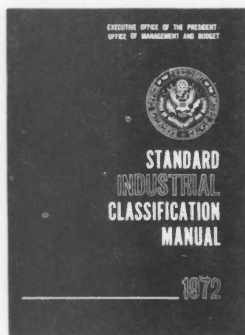
1977 SUPPLEMENT TO THE STANDARD INDUSTRIAL CLASSIFICATION MANUAL 1972

This publication is a 15-page supplement to the STANDARD INDUSTRIAL CLASSIFICATION MANUAL. It identifies two new industries, deletes one industry and modifies other industries, titles, definitions, and index items. It reflects the results of the experience of government agencies in using the 1972 Standard Industrial Classification. It serves primarily to make corrections to the 1972 edition in areas crucial to statistical programs. The relationship to the Enterprise Standard Industrial Classification Manual 1974 is also updated by this supplement.



ENTERPRISE STANDARD INDUSTRIAL CLASSIFICATION MANUAL 1974

This 26-page manual is a classification of enterprises (companies, firms, partnerships, or cooperatives) rather than establishments (plants, factories, mines, banks, hospitals, stores, or farms). The format of the manual has been changed so that the one or more Standard Industrial Classification (SIC) industries which define the enterprise industries are shown on the same page. A relationship to the 1968 edition is shown in an appendix.



STANDARD INDUSTRIAL CLASSIFICATION MANUAL 1972

The Standard Industrial Classification was developed for use in the classification of establishments by type of activity in which they are engaged; for purposes of facilitating the collection, tabulation, presentation, and analysis of data relating to establishments; and for promoting uniformity and comparability in the presentation of statistical data collected by various organizations. The Standard Industrial Classification describes industries covering the entire field of economic activities: agriculture, forestry, fishing; mining; construction; manufacturing; transportation and utilities; trade; finance, insurance, and real estate; personal, business, repair, and other services; and public administration in the 650-page manual.

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NEW OCCUPATIONAL INFORMATION TOOLS

Standard Occupational Classification Manual 1977

The first issue of the *Standard Occupational Classification Manual (SOC)*, has been published by the Office of Federal Statistical Policy and Standards. This standard provides a statistical classification system for occupations that should make statistics compiled by different agencies much more comparable, as the Standard Industrial Classification does for industries. The 360-page Manual was developed to fill the need for a standard classification to be used in Federal and other programs in which occupa-

tional data were collected.

The SOC, with over 600 occupational groups, is not expected to meet all the needs of all agencies but rather it is intended to be used as the framework which all surveys should use to provide comparability at some level with other occupational statistics.

The SOC can be related to *Dictionary of Occupational Titles*, which was developed primarily for job placement and job analysis. (See below.)

Dictionary of Occupational Titles, Fourth Edition

The 1977 edition of the *Dictionary of Occupational Titles (DOT)* which contains information on approximately 20,000 occupations found in the U.S. economy, has just been published by the Department of Labor's Employment and Training Administration. This is the fourth edition since it was first issued in 1939. Other editions were published in 1949 and 1965.

The DOT is used for classifying job applications and job orders, making referrals, assessing

worker transferability into related jobs, or relocating workers displaced by technological change. The changes in the new edition are aimed at providing a broader base for those uses.

This new edition includes 2,100 occupations that have been identified since the last edition. More than 3,500 definitions have been eliminated because of obsolescence, technological change, or duplication of other jobs.

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Through articles and short features prepared by experts in their fields, the *Social Security Bulletin* each month assesses changes in social-insurance and income-maintenance programs and their impact on individuals and the economy. Many studies focus directly on the old-age, survivors, disability, and health insurance program and cover, for example, such subjects as women's and younger workers' future retirement benefits and Medicare's effect on the aged and disabled populations. Also measured is the economic situation of the low-income population and the impact of supplemental security income benefits. Other articles document new developments in private insurance and employee benefits; foreign social security

systems, and programs such as railroad retirement, workers' compensation, and unemployment insurance. Year by year changes in national expenditures for health and social welfare are reported. A special section in each *Bulletin* issue is devoted to current operating statistics from social security and related programs. In addition to the 12 monthly magazines, subscribers also receive the *Annual Statistical Supplement* to the *Bulletin* featuring an extensive compilation of general time-series data on social security and the economy as well as interprogram data, program definitions, and historical summaries of social security legislation.

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