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RECENT ADVANCES IN GOVERNMENT STATISTICS

An Address

by

Mrs. Aryness Joy Wickens, Acting Commissioner  
of Labor Statistics, U.S. Department of Labor,  
at the 114th Annual Meeting of the American  
Statistical Association, Montreal, Canada,

September 11, 1954

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The improvement of statistics, like the improvement of techniques of industrial production, comes not so much from the introduction of revolutionary new methods or statistical inventions, but from the slow and careful application of familiar but effective techniques to existing statistical systems. This kind of improvement, which goes on constantly in statistical agencies, as in industry, is the source of many of our gains in statistics. It is unspectacular but effective. Today I should like to describe some new statistical series, most of which involve the application of well-known techniques, and also some of the methodological innovations which are in process in the Bureau of Labor Statistics.

Since the end of the war, it has been the policy of the Bureau of Labor Statistics systematically to revise its current statistical series, and as rapidly as practicable to put them on a post-war foundation.

Earlier, we have reported to this Association on the revisions of the Wholesale Price Index and the Consumer Price Index. The statistics of employment, hours, and earnings have been restructured and gradually extended to obtain data separately for every State and for about 120 areas on a comparable basis, in cooperation with State agencies. These employment data are checked each year against annual benchmarks from unemployment compensation reports and other over-all records.

In another field--occupational wage rate surveys--the Bureau's reports were re-oriented several years ago toward a community or labor area focus for principal metropolitan areas, in order to provide inter-city comparisons of wage rates--an addition to the familiar surveys of the occupational wage rate structure in particular industries, and union wage rates in certain crafts in other industries.

### Housing Starts

In 1954, the most recent of the major postwar revisions of the Bureau's regular statistics was completed--revised monthly estimates of the volume of new housing starts and related data on expenditures on home construction. These monthly reports of the number of new housing starts in nonfarm areas have been improved substantially in accuracy and amplified in geographic detail. Fundamentally, the national total of new housing starts is based on reports of building permits which come to the Bureau by mail from officials in cities, towns, and counties throughout the United States. The permit coverage in the new series is almost double that contained in the old, at present including over 6,000 local government areas, covering over 80 percent of the country's nonfarm population. Our field investigations reveal that the volume of new housing built without permits in those areas having building regulations is insignificant.

Using these reports, the current number of starts in every month is calculated by applying adjustments for cancelled permits and for the time lag before construction actually starts, derived from an annual "lag and lapse" survey. The remaining portion of the

national total, covering areas in which building permits are not issued, is estimated from field surveys in a highly stratified area-type sample. In developing both the sample of such non-permit-issuing places and in the combination of area data, up-to-date benchmarks from the 1950 Censuses of Population and Housing have been used. In addition to this new area sample, the other new feature of the calculation is the use of a ratio of housing starts in non-permit-issuing areas to building permits issued in contiguous areas. Tests conducted last year indicate that housing activity for which permits are issued is well correlated with activity in contiguous non-permit areas, and since permit volume is known each month, its use in the estimating function results in considerable increase in statistical efficiency over the old procedure.

Thus, one segment of activity in the very important construction industry is put on a postwar basis; but the important non-residential construction--and the total value of work done--remains unrevised and seriously in need of repair. This is one of our most important statistical gaps in the United States.

#### Measurement of "Fringe Benefits"

Experiments are also going forward on measurement of what has commonly been called "fringe benefits"--i.e., payments which are supplementary to cash wages, but which are part of total labor cost, such as paid holidays, paid vacations, and various types of insurance and pension plans. Here two studies are in process. The first will identify and define the various types of supplementary wage benefits; the second seeks to determine whether it is feasible to

measure the dollar value of these "fringe benefits," and how to go about it. This second study, involving reports from 1,000 manufacturing firms, is being conducted by the Bureau of Labor Statistics for the National Bureau of Economic Research.

#### New Developments in Employment Statistics

There are also some new statistical series which essentially are by-products of existing reporting systems; they are merely put up in new packages.

For example, this year the Bureau has begun to issue in its monthly report on Employment and Earnings indexes of total weekly man-hours worked in industrial and construction activity. These indexes are published for mining, manufacturing, and contract construction each month. For many years the Bureau of Labor Statistics has published monthly totals of the number of production workers in many industries, and the average hours they worked each week. Multiplying these two statistics to obtain total hours of labor input provides a more meaningful measure of short-run changes in industrial activity than either employment or hours alone. It is especially important from the point of view of labor. How much employment people in fact have depends both upon how many are at work and how long they work each week.

#### Wholesale Price Indexes

Another by-product set of statistics is the soon-to-be-issued economic classification of the Wholesale Price Index, classifying commodities into groups according to the point of flow through the manufacturing sector of the economy: (1) crude materials for further

processing; (2) intermediate products (essentially materials and components); (3) processed fuels and supplies; and (4) finished goods. Each group is appropriately subdivided. For example, finished goods are broken into two major groups: consumer goods and producer goods; consumer goods are further subdivided into foods, nondurable goods, and durable goods.

#### Speeding-up Reports and Extending Coverage of Existing Statistics

These are the principal new statistics of the Bureau of Labor Statistics, but as I indicated earlier, we are constantly working on the improvement of existing data, and on techniques for their compilation. Much attention has been devoted in the past year to speeding up the Bureau's reports, notably the monthly report on employment, hours, and earnings. This speed-up, at the request of the Chairman of the Council of Economic Advisers, has been one factor making possible the integrated release of information by two Federal Departments--the Department of Labor and the Department of Commerce--already referred to by Dr. Burgess.

For this integrated release, urged by the Joint Committee on the Economic Report, the Labor Department's Bureau of Employment Security provides weekly data on unemployment compensation claims. The Bureau of Labor Statistics, by the use of new electronic calculating equipment to which I shall refer presently, now makes these data available within less than three weeks of the period to which the report relates--a speed-up of ten days. The joint press statement by the two Departments eliminates the confusion which always confronts the public when several sets of statistics are issued separately. It should be

pointed out, however, that much remains to be done in getting definitions, concepts, timing, and methodology of the several series on employment and unemployment better in line.

As always, the slow, careful, unspectacular work of improving the content and extending the coverage of current statistics proceeds. Reports on labor turnover in manufacturing, for example, are being expanded, virtually doubling the sample, to increase the accuracy of the data. The Bureau's statistics of work injuries have been enlarged to provide more detail and have been put on the basis of the Standard Industrial Classification and extended to cover injuries to selected groups of governmental employees.

#### Mechanization and Quality Control

A great many improvements have been made in mechanizing calculations and in the application of quality controls to our statistical surveys. In an agency like the Bureau of Labor Statistics, which produces many different kinds of statistics, the problems encountered in mechanization and quality control are not unlike those found in a large, diversified manufacturing enterprise making many kinds of products. Each set of statistics has its own problems of sampling and field collection and tabulating procedures, so that each set of tests must be tailored to the particular product.

In the collection process, regular supervision is being supplemented by quality control checks by re-interview on a systematic basis. A sample is selected of original visits by each interviewer, re-visits are made, and the original interview rated as acceptable or not acceptable. A sequential sampling plan is employed to determine

the adequacy of an interviewer's work performance. Some four to ten re-visits are made for each interviewer whose work is given an evaluation once during a year. This quality control program has been in operation in the Division of Wages and Industrial Relations during the past year, and will be introduced into the Construction program shortly. Similar techniques have been used in the past in Surveys of Consumer Expenditures and in checks on the validity of retail prices. A new set of quality control charts is now being devised for use in connection with the assembly of various types of retail prices.

In the tabulation process, a system of quality control in editing and processing has been made possible by the new electronic calculating machines, which provide much more speed of operation and greater potential cross-calculating devices. With the use of this equipment, the Bureau has begun to introduce more mass mechanical editing procedures. For each survey, a set of criteria are designed which usually include ratios or other relationships secured from the reported data. Examples of such criteria in the case of employment statistics are average weekly hours, average hourly earnings, or the relation of production workers to all employees. The range of monthly price changes, for example, is used in editing the Wholesale Price Index. Each report is then tested against these criteria by the mechanical and electronic equipment. Since these checks are linked, the probability of a report passing every check and still being in error becomes very small. Any report not meeting standard tests is reviewed to determine its reliability before further processing.



These procedures, of course, place a heavy weight on the accuracy of the original data.

The first of the Bureau's elaborate index calculations to be wholly mechanized--beyond the editing stage--was the Wholesale Price Index. When this index was revised, the entire plan was geared toward mechanization of the calculations. It provided for the mechanical electronic equipment to develop necessary reference and publication records and all figures needed for the final indexes. A series of checks were instituted as by-products of the operation to insure the completeness of the basic data and the accuracy of the calculations. The machines handle both the calculation of the relative change from the previous period, and the weighting factors, calculating indexes for small cells and working these into larger and larger groups mechanically. The end result is photographed directly from the run sheets, for use in the final press statement.

A similar mechanical system is now being introduced into the calculation of the employment statistics, step by step in order not to delay the release. These data involve 110,000 schedules, the majority of which are processed within three weeks of the report date. First, there is mechanical screening of the sample to sort out erroneous information, previously done by laborious clerical review of machine listings after tabulation of the data. Reports carrying doubtful information are automatically removed for inspection. In the next phase, the Bureau is programming for the mechanical combination of tabulated sample totals into publishable figures similar to the devices used in the Wholesale Price Index. There remain to be solved,

however, certain technical requirements involved in a link relative system which also contains simultaneous corrections for bias.

It is this kind of enterprise which increases the productivity of our statistical agencies year after year, making it possible for us to produce better statistics faster, with budgets which seem constantly to dwindle.

#### Interindustry Statistics Suspended

In all candor, I think it must be said that we do not always move forward on all statistical fronts. This year there is one important example of retrogression; it is the virtual suspension in the Federal Government of the developmental work on interindustry, or as it is often called, "input-output" analysis, by the withdrawal of funds late in 1953. This is one of the most important recent innovations in quantitative national economic analysis, although its far-reaching importance is not yet widely appreciated. It is now clear, I think, that the many problems which had to be surmounted before this new approach could be put on a thoroughly practical basis--problems in theory, in computation, in fact-gathering--can be successfully met.

The Bureau of Labor Statistics, with a record of work in this field extending back to 1942, has contributed in many ways. In particular, it carried through the monumental study of United States inter-industrial flows for 1947. It is not too much to say that in this area, the Bureau has broken the trail for the active programs of input-output work to be found today in many nations around the world. Currently, analyses using the technique are being made in the

United States, but developmental work has ended. It is to be hoped that this general area of statistical analysis will soon be resumed in the United States, in view of its immense potential contribution to the rational solution of the economic problems of prosperity or recession, of internal or external trade, and of peace or war. Especially, it will be important to plan for a new model which will make use of the new Census data from the Censuses of 1954.

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There remain many gaps in economic statistics in the United States, as the Subcommittee of the Joint Committee on the Economic Report, whose Chairman is today a member of this panel, has found. Those of us who produce statistics are only too keenly aware of what remains undone. We take comfort both from the fact that we do make improvements as the years go by, and that the need for a better statistical system is being more widely recognized, both in official and in private circles.