

November 1964

NEWSLETTER

Committee on Computers in Research  
Federal Reserve System

Programmers, economists, and others in the Federal Reserve System are invited to submit contributions to the Newsletter. Contributions may consist of program routines, programming techniques, computer applications for economic and statistical research, and similar matters of interest to System personnel.

Contributions may be submitted to members of the Committee on Computers in Research or to Emanuel Melichar, Economist, Division of Research and Statistics, Board of Governors.

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NEWS NOTES

Boston

Report on printer.--The on-line 1443 printer which we obtained last spring for our IBM 1620 computer is working out well. All of our routine programs have been rewritten to make use of this output form, and we are pleased with the results thus far.

Regression program.--We are engaged in writing (in FORTRAN) a multiphase regression program that will fit our machine and give us more flexibility than the canned programs we now use. Output will include information ranging from a simple correlation matrix of the variables to Durbin-Watson statistics.

Computer replacement.--As a matter of curiosity, we would be interested in hearing whether anyone is considering replacement of their computer and if so, with what equipment.

Stephen Lofgren  
John J. Arena

New York

Faster tape drives installed.--We have replaced the five 7330 tape drives on the 1410 with 729V tape drives. For the first few weeks only assemblies and compilations will be processed at 800 characters per inch density; later on we will gradually convert all files to the new high density.

New Fortran compiler.--We are quite pleased with Version 3 of 1401 Fortran. The facility to link segments and to generate a library tape of Fortran programs will be quite helpful.

Regression data plotter.--We recently completed a program (a combination of 1410 Fortran and Autocoder) to plot the input data to our multiple regression program. Selected combinations of variables, or all possible combinations, may be plotted. Still in the planning stage is a program to plot the variables as transformed by the regression program.

Curve-fitting.--A 1401 Fortran program was recently completed to calculate, by the least squares method, an M degree polynomial where M is not greater than 10. The program is organized to calculate successive curves, for various values of M; an F test is used to determine the best fit from among the several curves specified.

Computer personnel.--The Research Function now has fourteen persons engaged full-time on computer work. We have eight persons in the computer section of the Financial and Trade Statistics Division, four in the Market Statistics Division and two in the Balance of Payments Division.

Fortran class.--Recently we used IBM's Fortran Self Study course as text material for a small class that met once a week. Class members liked the texts, but it seems that it is not good practice to extend the course over too long a period. It would be better to allow the students to spend several hours of their regular work day on the course material and have at least three group meetings with the adviser every two weeks.

Ralph C. Schindler

Richmond

Computer size increased.--On October 24, the size of our IBM 1401 computer was increased from 4K to 8K.

Money supply study.--As a first step in a study of causes of the changes in the structure of the money supply, simple correlation analysis of total money supply and its major components were made with 16 economic series. A program was written to compute first differences of quarterly data, in the format required for the SCOR program obtained from the Federal Reserve Bank of Philadelphia.

Certificate of deposit study.--In an attempt to trace the CD activity of small banks, a program was written to compute and list, by bank, large daily changes in time deposits from the Reports of Deposits Subject to Reserve Requirements.

Electric power series.--We have completed the programming of the Electric Power Series using the additional capacity of our new 1401-8K computer. In addition to editing procedures for the individual company reports, the output consists of punched cards for the Board and a printout for our files.

Elizabeth W. Angle

Atlanta

Regression analysis.--Several multiple regression series have been run for us by the Board and we have written a program that computes an F-ratio for variance analysis of the output.

Rank correlation.--A program that computes a Spearman coefficient of rank correlation has been written.

Martha Bethea

St. Louis

Data bank for time series.--About 50 economic time series that are frequently used are being maintained on punched cards in a central data bank. A standard card format is being employed for all of these series, permitting them to be conveniently used as input for a number of analytical programs that have been developed. The latter includes such routines as annual rates of change, index numbers, and weighted moving averages.

Leonall Andersen

## Minneapolis

Simple regression program.--A simple regression program (SCRAPE) for the IBM 1620 has been completed. It computes, punches, and/or prints the residuals, the standard error of the estimate, Durbin-Watson statistic, t test for the regression coefficients, F test for linearity, correlation coefficient, and coefficient of determination. Several short programs to transform the input data or to utilize the output have also been written.

Regional stock index.--A regional index has been devised for the prices of the stock of 100 companies active in the Ninth District. Four indexes are computed: rail, utility, industrial, and total. The computer program used provides for an edit run to check the input data as well as for the calculation of the indexes.

Data processing programs.--Programs have been written for the FR 644 report, building permits tabulation, and for comparison of call report data with loan items reported for FR 644 and with deposits items in the bank debits reports.

Marjorie Templeton  
Carol Keyt  
R. E. Kaatz

## San Francisco

Seasonal adjustment program modified.--In connection with our work on the deposit series for our District (part of the CCRS project concerning turn-over ratios), we have prepared a sub-routine for the X-9 seasonal adjustment program that modifies the 12-month moving average. This modification follows the suggestions included in the paper by Milton Moss at the Seasonal Adjustment Seminar in 1962.

Persons familiar with the Current Reporting Committee's project know that the X-11 program is to be used for seasonally adjusting the debit data. This program can use results of spectral analysis as a means of evaluating results. For those who are interested in this technique, there is an article on the subject by Marc Nerlove in the July issue of *Econometrica*.

Donald Snodgrass

## Board of Governors

COBOL class.--Two COBOL classes for novices are being conducted during the fall months. These classes consist of 24 classroom hours as compared with the 18 hour classes previously held for our experienced AUTO-CODER programmers.

About 55 members of our staff will be trained in COBOL at the completion of the fall classes. Our experience with COBOL has been very positive. It is easy to teach and easy for the novice to comprehend. Our personnel who are experienced programmers have found, after an initial

period of experimentation, that use of COBOL results in faster writing and debugging of programs.

Econometrics course.--About 25 persons are enrolled in a course in econometrics that started on October 6. The classes, which meet for one hour twice a week, are being taught by Dale Osborne and John Wood. The principal text being used is J. Johnston's Econometric Methods, supplemented by L. R. Kleins' An Introduction to Econometrics, and M. J. Brennan's Preface to Econometrics. Elementary probability theory and statistical inference, largely from Brennan, is being reviewed prior to going through Johnston, which will be covered closely. It is assumed that the students already possess a knowledge of elementary calculus, of about the level found in Brennan.

Econometric theory will be applied by the students to the estimation of economic models and to the treatment of problems arising in connection with regression. Actual problems from the Board's work will be considered during the latter part of the course.

The present course represents a continuation of a training program in mathematics and econometrics. Last year's course, which ran from October 1963 to May 1964, included topics in algebra, elementary calculus, elementary probability and statistical inference, and an introduction to regression analysis.

Compilation of Business Conditions Section programs.--The Business Conditions Section has compiled a list of the general purpose computer programs originated and in use in the Section as of August 14, 1964. Copies of the report have been distributed to members of the Committee on Computers at the Reserve Banks, and additional copies are available from the Business Conditions Section.

A brief description of each program is provided in the report. The list includes 15 programs for various aspects of multiple regression analysis and for estimation and simulation of simultaneous equations, 7 growth rate programs, and 15 programs that comprise a general purpose system for tabulation of survey data. Also, included are a number of miscellaneous programs for simple regression, calculation of index numbers, computer plotting of time series, and preparation of data for the Board's charting machine.

Compilation of Board programs.--The Division of Data Processing is undertaking to compile a list and abstracts of computer programs used at the Board. It is expected that this compilation will provide a convenient means of attaining the interchange of knowledge about existing programs that must precede exchange of program use among individuals and sections at the Board. The first compilation is expected to be completed by the end of November.

Intraweekly seasonal adjustment program.--A 1410 Fortran program has been written to adjust a daily time series for the five-day intraweekly pattern. The series may be multiplicative or additive in its components, but the intraweekly pattern must be constant; up to 52 weeks of data may be used.

New financial statistics system.--During the past three months the Financial Statistics Section has initiated programming for the following new systems for banking data:

1. The automation of the FR 416 reports is requiring the following programs:

a. Three programs are being written for the automated FR 416 reporting procedures. The first program receives district summary data in thousands of dollars, performs all possible edit checks, and prints the H.4.2 release. This part of the system will employ a telegraph-to-paper-tape-to-card procedure similar to that currently used for the interdistrict settlement fund. The second program is designed to receive individual bank FR 416 data, write the data on tape, and prepare money, market and Federal Funds reporting totals. Plans for keypunching back data for this series were discussed at the last meeting of the Committee for Current Reporting Series. A third program will provide means for the retrieval and analysis of these back data.

b. Two programs are being developed to handle the sample and universe data requested in the Board's letter of October 16. Complete specifications for this reporting system were described during a meeting held at the Board on October 26 and in the memoranda distributed to the Reserve Banks later that week.

2. Programs and systems for handling the daily reports of deposit accumulated by the Reserve Banks since November 1959 are nearing completion. This project was described in Board letters S-1932 and S-1932a of October 8.

3. Planning of an over-all system for handling the new debits series is virtually completed, and programs needed to process these data will be written before the end of this year.

Dale Osborne  
Robert M. Steinberg  
T. J. Vander Noot, Jr.  
John Wood  
Emil Melichar

Committee activities

Program documentation.--At the request of the Committee, Ronald E. Kaatz of the Federal Reserve Bank of Minneapolis has written a Program Documentation Guide. Copies are available from Committee members at the Reserve Banks and the Board.

IBM computer configurations in the Federal Reserve System  
October, 1964

Bank	Computer	Read Punch	Printer	Disc. File	Tape Units	Special Features
Atlanta	4K-1401	1402	1403	-	3-7330	1,2,3,4,5,7,8,9,10
Boston	1620 4K-1401	1622 1402	1443 1403	- -	- -	a/ all
Chicago	650	-	407	yes	4	-
Cleveland	8K-1401	1402	1403	-	4-7330	all
Dallas	8K-1401	1402	1403	-	4-7330	1,2,4,5,7,8,9,10
Kansas City	16K-1401	1402	1403	-	4-7330	1,4,5,6,7,8,9
Minneapolis	1620	1622	1443	1311	-	-
New York	40K-1410 8K-1401	1402 1402	1403 1403	- -	5-729V 4-7330	- 5
Philadelphia	8K-1401 4K-1401	1402 1402	1403 1403	- -	- -	1,5,7,8,9 5
Richmond	8K-1401	1402	1403	1405	-	1,4,5,6,7,8,9,10
St. Louis	4K-1401	1402	1403	-	-	1,2,3,4,5,6,9,10
San Francisco	8K-1401	1402	1403	-	4-7330	5
Board of Governors	40K-1410	1402	1403	-	4-729II 1-729IV	Priority, Accelerator

a/ Indirect addressing, automatic division, T.N.F., T.N.S., M.F.

1401 Special features

- |                             |                               |
|-----------------------------|-------------------------------|
| 1. Multiply - divide        | 6. Expanded print edit        |
| 2. Read and punch release   | 7. Advanced programming       |
| 3. Punch feed read          | 8. High - low - equal compare |
| 4. Print storage            | 9. Sense switches             |
| 5. Additional print control | 10. Early card read           |