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REGRESSION PROJECTION PROGRAMS WITH MULTIPLE OPTIONS FOR USE ON MS-DOS MICROCOMPUTERS

B. Proration Projections

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REGRESSION PROJECTION PROGRAMS WITH MULTIPLE OPTIONS FOR USE ON MS-DOS MICROCOMPUTERS

B. Proration Projections

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SECTION I

INTRODUCTION

The Fortran computer model for Regression Proration Projections contained herein represents direct adaptation of the corresponding Fortran IV program for mainframe computer previously published by the Kansas State University Food and Feed Grains Institute under predecessor agreements with the U. S. Agency for International Development. The compiled microcomputer version of the Regression Projection Program incorporates all features of the latest version of the mainframe program while providing additional flexibility to the microcomputer user.

Differences between the mainframe version and the current microcomputer version include the following:

1. The Prorate Projection Model for microcomputer does not develop master projections; a separate Master Projection Model and accompanying manual are available for this purpose. The PRORATPJ model includes a companion front program (PRORATE1) to read the command instructions and titles from the keyboard and create an input file for PRORATPJ to read and follow in making the projections.

2. These programs are operated from menus which indicate instructions on the screen, and the user enters the control commands and information for his problem through the keyboard. Default values for the entries are presented on the screen to serve as pattern to the user. Those default values which are applicable for the run can be accepted by keying <return> at the appropriate point.

3. Input steps for command instructions and data input are modified to better suit microcomputer users, especially those familiar with popular electronic spreadsheet software such as LOTUS 1-2-3.

4. Results of computational routines can be stored in disk files for access by subsequent runs and/or programs, so that user options are enhanced.

5. The Alternative Math library used to link the current programs facilitates rapid computation with sufficient accuracy for accounting purposes better than other math libraries and can operate on all IBM-compatible hardware, whether or not an 8087 coprocessor is available.

6. The micro version is dimensioned for up to 200 rows (periods) by 18 columns (components), or vice versa, rather than the 250 rows by 20 columns of the mainframe version because of capacity limits of the Heath Fortran 77 DOS compiler. Rarely will the user find this limitation to be a problem.

Each program in the microcomputer version of the family of computer programs for feasible agribusiness development is being published as a separate manual, replacing Volume II, Computer Programs, for mainframe computers. At this writing, four other manuals are available in this form. They are "IRR Feasibility Analysis Program for Use on MS-DOS Microcomputers", "Information for Using

Fortran Programs with MS-DOS Microcomputers", "Proforma Financial Analysis Program for Use on MS-DOS Microcomputers", and "Transportation Linear Program for Use on MS-DOS Microcomputers". The manuals are available with or without the corresponding program and instructional diskettes. Volume I containing text and charts of Special Report No. 2, "User's Guide to Computerized System for Feasible Agribusiness Development", is equally appropriate for microcomputer and mainframe analysis.

The regression projection programs operate on any MS-DOS microcomputer with at least 164 K bytes of memory. The programs were compiled with the Heath Fortran 77 Compiler without 8087 Coprocessor and with ALTMATH.LIB. They can handle up to a total of 200 time periods by 18 components, or vice versa, and up to eight different variables per run. Output is formatted for 130 columns so that a wide printer or condensed print is needed for the hard copy output. A sample BASIC program file, 17PITCH.OKI, is included on the MPJ Master diskette for converting Okidata printers to typesize of 17 characters per inch. Similar BASIC programs can be written for making this kind of conversion on other printers which are not controlled directly.

The user data input for the PRORATPJ program is read from the logged drive as file PPJDATA.RUN on the same disk with the OUTPUT.MPJ file and the linked program file, PRORATPJ.EXE. As provided, the program disk contains four sample data files, PPJData.One, PPJData.Two, PPJData.Pan and PPJData.Agr, any of which can be used as pattern in preparing your user data file. Use the PPJData.One pattern if you plan to make straight prorations, the PPJData.Two pattern for non-linear prorations, the PPJData.Pan pattern for Y-estimation problems, and the PPJData.Agr pattern for superimposed transition problems. The desired pattern file can be copied to your work disk with COPY, renamed with REName to PPJDATA.RUN, and by editing with EDLIN, changed to the data file for your user problem. Then it can be copied to the program disk with COPY as PPJDATA.RUN for running your problem. Alternatively, LOTUS 123 can be used to create input data files for the projection programs, as explained in Section IV of the Manual.

When you are ready to make the master projection run, simply type x:PRORATE1, where x is the drive containing the disk with the program and data files. The program menu then will be displayed, and you will be prompted for the information and commands for your run. Default values are provided as patterns for your entries. When the commands have been entered ready for program execution, you will be reminded that the program will now prepare the INPUT.PPJ file for the prorate projection run. Upon completion of this step, the program will prompt you to call PRORATPJ to make the projections ordered.

To make a trial run, REName one set of the files, say OUTPUT.ONE, INPUT.ONE and PPJDATA.ONE, to OUTPUT.MPJ, INPUT.PPJ and PPJDATA.RUN, respectively, and then type PRORATPJ and <return>. After you have made the run, don't forget to rename the files back to OUTPUT.ONE, INPUT.ONE and PPJDATA.ONE. Otherwise when you copy back the data file for your own problem from the work disk to the program disk, the original will be lost as it is replaced by your OUTPUT.MPJ, INPUT.PPJ and PPJDATA.RUN files. This same procedure should be followed to retain input data files for problems you have run in the past, retaining them as OUTPUT.III, INPUT.III and PPJDATA.III, etc., for example, so that OUTPUT.MPJ, INPUT.PPJ and

PPJDATA.RUN always are open for the current run, and no data file will be lost by over copying.

The sequential steps for the Prorate Projection program input are as follows:

1. Prepare your data file in tabular format with rows from 1 to n for the n accounting periods and columns for the period sequence, period identification, and then data columns for each of the components or columns in the prorate table to be projected.

2. Select a default file to serve as pattern for your commands, e.g., DEFAULT.ONE, and rename the file to DEFAULT.PRO. Be sure this file is on the same disk as your PRORATE1.EXE file, if necessary by copying it over with the DOS resident command, COPY.

3. Logged in the drive containing these files and enough empty capacity for the program to write the INPUT.PPJ file, type PRORATE1 <return>.

4. Follow the screen Menu prompts to enter the information and commands for your problem. You can follow the menu in any order, and can make changes any time up until the program execution command.

5. Upon completion of the PRORATE1 run, you will be prompted to call the PRORATPJ program to make the prorations. Before doing so be sure that the four disk files, PRORATPJ.EXE, OUTPUT.MPJ (from a previous MASTERPJ run), PPJDATA.RUN (from Step 1) and INPUT.PPJ (from Step 4) all are on the active disk drive.

6. Initiate the prorate projection run by typing PRORATPJ <return>.

7. You will be reminded to prepare your printer or disk file to receive the program output before execution of the program. Remember that the output needs 130 columns, so plan for wide paper or small type size. As indicated by the screen prompt at this point, type Ctrl P to echo the output to your printer, or use the > key and drive and file identification to route the output to disk file for later printing.

8. When the execution screen appears on your monitor and all is ready, the program is executed by keying <return>.

SECTION II

GENERAL DESCRIPTION OF THE REGRESSION PROJECTION PROGRAMS

The PRORATPJ and (MASTERPJ) regression projection programs are multi-purpose tools for developing projections of market potentials, market prices, production potentials, input requirements, and other items needed for development planning and feasibility analysis. Alternative regression model forms can be specified for use in developing the projections from historical time series data. Regression coefficients are computed to assist the user in selecting the most reliable model and set of projections for the purpose at hand. Historical data for making the projections at both the master (MASTERPJ) and prorate (PRORATPJ) levels can be read into the program directly, or alternatively can be estimated as dependent variables from historical observations of related independent variables.

Master Projection Program

The analytical package consists of two distinct programs, MASTERPJ.EXE and PRORATPJ.EXE. MASTERPJ is the Master Projection package for developing projections of aggregate "master table" statistics period by period into the future as far as the economic horizon of planners may extend. Each column of data in the master tables is fitted and projected separately from corresponding data in other columns in the same tables. For example, a master table containing annual winter wheat production by state in the U. S. A. would contain separate and independent columns of data for each state plus a total column representing the horizontal sums of the state columns for each year. For many kinds of application, the master table projections are all that is needed. Use of the MASTERPJ program is described in a companion manual.

Accompanying the MASTERPJ program is a preparatory program for reading input from the keyboard in response to screen prompts, MASTER1. This program creates the file of commands to be read by MASTERPJ called INPUT.MPJ. This file together with the file of historical data which serves as basis for the projections, MPJDATA.RUN, provides the total input to the MASTERPJ program for making a run to obtain the requested master table projections.

Prorate Projection Program

As its name implies, the PRORATPJ program is used for developing projections of components or prorated data based on one or more single columns in the corresponding master table. For example, a prorate table might contain historical and projected winter wheat production by county for a single state in the master table, e.g., Kansas. As developed by PRORATPJ, both the historical and the projected prorate (county) data are fitted to and forced to sum to the corresponding column in the master table. In this manner one is assured that the components (counties) sum exactly to the master (state) total. For problems of this kind, the user commands MASTERPJ to create a data file so that the proration projections can be developed with PRORATPJ in a subsequent run after the master projection run has been completed. Use of the PRORATPJ program is described in this manual.

Accompanying the PRORATPJ program is a preparatory program for reading input from the keyboard in response to screen prompts for the prorations, PRORATE1. This program creates the file of commands to be read by PRORATPJ called INPUT.PPJ. This file together with the file of the corresponding master projections created by a previous MASTERPJ run, OUTPUT.MPJ, provides the total input to the PRORATPJ program for making a run to obtain the requested proration projections.

Sequence of Analytical Routines

There are some differences in the analytical routines of MASTERPJ and PRORATPJ, but the same general steps and processes are followed in the two programs. First, the read programs, MASTER1 and PRORATE1, read a series of user-supplied command instructions and factors, together with titles, column headers and footnotes, and set up the problem for analysis in the respective run files, INPUT.MPJ and INPUT.PPJ. Following this, the user calls PRORATPJ (or MASTERPJ) to read the input files and historical base data and run the problem. In these programs, a short main program first reads the logical unit numbers for accessing input and directing output, as well as the total size of the problem, and then sets up the dimensions for the analytical routines in the projection subprogram. The programs then read the command instructions and historical data input from the previously prepared disk files. After this, each of the programs conducts the special things ordered by the user (setting up period designations, rearranging columns in the table, application of cyclic factors, setting up of subordinate analysis, etc.). Next, the programs call the REGression Subroutine to fit the statistical time trends and then use the coefficients to make the projections ordered.

If used for routine proration problems (JCOUTY = 1), the PRORATPJ program will also make analysis for y-estimates and/or make conversion tables, but will not plot graphs nor conduct the special food security analyses at the proration level. If used for superimposing multi-dimensioned transition or growth patterns (JCOUTY = 2), PRORATPJ will develop the resulting overall transition patterns at this point. The last step in each program is to convert the output to integer numbers and print the output and disk files ordered for the run.

Both programs read the command instructions, titles, and data supplied by the user from a specified and formatted microcomputer disk file. The basic read format is I3, 1X, I4, 8 F 9.0 for comparability with electronic spreadsheet formats such as those of LOTUS. These files must be set up in advance of the run. In addition to the MASTERPJ.EXE file, master projection runs need the input command file, INPUT.MPJ, the basic data file, MPJDATA.RUN and, if it is requested, space for the output file to be created by the Masterpj run, OUTPUT.MPJ. Proration runs need PRORATPJ.EXE, OUTPUT.MPJ, INPUT.PPJ and PPJDATA.RUN, and, if requested, space for the new file to be created in the Proratpj run, OUTPUT.PPJ.

Uses and Options of the Programs

The most common application of the projection programs has been for developing schedules of expected future quantities of supply and/or demand of specific commodities at specific markets. Such schedules are needed for many kinds of economic feasibility analysis and economic development planning. They are useful

for estimating market potentials and future economic opportunities to exploit comparative advantages which may not be apparent at present. Because of their versatility in applying alternative time-trend models and approaches, they are useful in helping reduce uncertainties of future conditions which depend upon trends now in place. This is particularly true of projections which can be prorated to reliable aggregates with assurance that the prorated components (subareas, market shares, subproducts, trade components, labor components, or whatever the subunits may be) will balance to the reliable master projections.

Other uses of the programs may be more subtle. Often those working with several tables find the need for cell by cell addition, subtraction, multiplication, division or more complex treatment. These kinds of manipulations can be done handily with database management software or with electronic spreadsheets. However, if several steps are involved, and particularly if y-estimates, charts, conversion tables, prorate tables, and other analyses are to come later, the MASTERPJ and PRORATPJ programs become attractive alternative software for these kinds of applications. This can be true even when none of the kinds of projection uses outlined in the previous paragraph are evident.

Specific Options for Master Projections

Major master projection options in the order that the command instructions are read by the MASTERPJ program include the following:

Option	Program Step	Variable	Implementation Command
Y Estimates	0-7	NFAC	Integer greater than 1
Base Time Period	1-2	NU	Integer < = total periods
Exponential Model	1-3	IX1, IX2	Non-zero integer
Projection Horizon	1-5	NP	Non-zero integer
Regression Form	1-7	IFORM	Integer of 1(+) to 4(/)
Logarithmic Model	1-9	LPRJ	Integer of 1
Given Growth Rate	1-10	KRATE	Integer of 1
Reflect Cycles	2-1	ICYC	Integer of 1
Omit Total Column	2-2	NOTL	Integer of 1
Disk File of Main Table	2-4	KARDM	Integer of 1
Disk File of 2nd Table	2-5	KARDT	Integer of 1
Spanish Output	2-7	NLANG	Integer of 1
French Output	2-7	NLANG	Integer of 2
Project Negative Nos.	2-9	NEGNO	Integer of 1
Ignore Negatives	2-10	NONEG	Integer of 1
Annual Periods	3-1	IANN	Integer of 1
Quarterly Periods	3-2	IQTR	Integer of 1
Monthly Periods	3-3	IMON	Integer of 1
Rearrange Columns	3-9	IMOVE	Integer of 1

Option	Program Step	Variable	Implementation Command
No. of Input Sets	5-1	NCS	Integer value
No. of Output Pages	6-1	INO	Integer value
Conversion Table	7-1	IFEED	Integer of 1
Make Graph of Trends	7-3	IPLOT	Integer of 1
Prorate Projections	7-4	JCOUTY	Integer of 1
Multiple Transition	7-4	JCOUTY	Integer of 2
Table of Estimates	7-5	JEST	Integer of 1
Deviations from Trend	7-7	NDEV	Integer of 1
Fit Trend (if NP = 0)	7-8	NFIT	Integer of 1
Food Security Anal.	9-1	ISTOCK	Integer of 1 or 2

Specific Options for Proration Projections

Major options subject to user control within the PRORATPJ program include the following, also in the general order in which the commands read by program:

Option	Program Step	Variable	Implementation Command
Master Column	1-1	ISTATE	Integer greater than 2
Exponential Proration	1-2	IX1, IX2	Non-zero integer
First Prorate Year	1-6	ICYEAR	Specified integer
Log Prorate Model	1-7	LPRJ	Integer of 1
Y-Estimate Prorates	1-8	IYES	Integer of 1
Cumulative Transition	1-8	IYES	Integer of 2
Bypass Prorate Trend	2-2	ISINGL	Integer of 1
Conversion Tables	2-3	IFEED	Integer of 1
Omit Disclosing Model	2-4	NOMOD	Integer of 1
Disk File of Proration	2-5	ICARDM	Integer of 1
Disk File of Conversion	2-6	ICARDS	Integer of 1
Subtotals by District	3-1	IDIST	Non-zero integer in second field
Override Y-Estimates	5-1	NOEXCP	Non-zero integer

SECTION III

CONCEPT OF TIME TREND ANALYSIS AND PROJECTION

Statistical fitting and projection of historical time trends are among the most widely used procedures for looking into the future. Simple time trends sometimes provide basis for more realistic long-term projections than more complex mathematical models. Time trends reflect a host of forces impacting the variable of interest so that the trend variable in estimating equations often picks up most of the causal factors impacting the variable which one is interested in projecting. The phenomenon is so common that one usually can expect past trends to continue unless specific forces can be identified which will change these trends in the future. Even in such cases, there seems to be a tendency for analysts to overestimate the influence of forces which cause long-run trends to change and to underestimate the continuing influence of those factors which the historical time trend reflects.

Measuring Long-Term Trends

Long-term trends of demand and supply shifters for most resources, products and services can be fitted and tested statistically for use in making projections into the future. These trends may or may not be constant through time. Some may be constant in percentage terms rather than in absolutes. Others may be changing at increasing or at decreasing rates. For these reasons, the selection of the mathematical form of the time trend model needs to be given careful thought.

Often projections for products of interest are dependent upon several underlying factors, each of which is subject to a different kind of time trend. For example, the projected volume of demand for a product--rice, for instance--is a function of the projected human population of concern (usually by segment) and the average per capita consumption. Projected average per capita consumption in each population segment is a function of projected per capita income, projected relative prices and preference patterns. In such cases more accurate and reliable projections can be determined by developing separate projections of the components (say population, per capita income, etc.), and then combining these in functional form to obtain the projections for the commodity of interest--say rice. Once this has been done, the projections for this commodity can be used as basis for projections of derived products (say rice mills or small plastic bags in which to market polished rice).

Sometimes structural changes occur to modify the shape and/or slope of trend lines for some variables. For example, such changes took place to substantially increase the rate of growth in nitrogen fertilizer use in the USA in the early to mid 1950s. In such cases, the base period for projections into the future needs to reflect the relevant historical period after the structural change rather than to lap back into the pre-change period.

Time trends for some variables are clouded by cyclic and other shorter term patterns as well as by random fluctuations around long-term trends. In such cases, cyclic and seasonal patterns need to be identified and reflected in the projection models in order to obtain statistically significant and reliable projections of these variables.

Projection Alternatives

All of these kinds of forces and differences enter into the choice of projection options available to the user of MASTERPJ and PRORATPJ. These can be summarized under (1) type of time-trend model, (2) direct or dependent variable projection, (3) historical base period for model, (4) application of cycle factors, and (5) master versus prorate projections.

Type of Time-Trend Model. Different models fitted to the same historical base can give quite different projections, and the reliability of such projections may differ as well. The MASTERPJ and PRORATPJ programs provide several model options, and will output values for R-squared, Sb and other statistical parameters as well as plot graphs to assist the user in choice of model. The types of time-trend models in the program include the following, where Y is the value projected and T is the time period:

Linear model of the form Y = a + bT
Natural log model of the form LOGe Y = a + b LOGe T
Exponential model of the form Y = a + bT*, where * represents exponential values ranging from -1.0 to 3.0
Specified rate model of the form Y = a + rT, where r represents specified exogenously determined change rate.

Model specification comes at Step 1 of MASTER1 and MASTERPJ through IX1, IX2, LPRJ, or KRATE. Proration model options come at Steps 1 and 2 of PRORATE1 and PRORATPJ through IX1, IX2, LPRJ and ISINGL.

Direct or Dependent Variable Projections. Projections of key variables of interest can be developed as Y-table functions of related variables or as V-tables of the variable of concern directly. The Y-tables can be functions of up to eight independent variables, each of which may have its own type of time-trend model. Such projections by MASTERPJ provide separate output for each independent variable as well as for the Y variable. Those by PRORATPJ provide projections of the Y variable only.

Y-table specification comes at NFAC (Step 0) and IFORM (Step 1) of MASTER1 and at IYES (Step 1), NOLOOP (Step 2) and ATRCEP and BCOEF (Step 4) of PRORATE1.

Historical Base Period for Model. The number of historical base periods (counting backward from the last time period of data input) as basis for fitting the model is read at NU (Step 1) by MASTER1 and at NK (Step 1) by PRORATE1. The value can be any number up to and including the total number of periods of data read in (NA at Step 1 of MASTER1). If needed to detect structural inflection points, graphic options are requested at NPLOT in Step 8 of MASTER1.

Application of Cycle Factors. For cases involving variables which exhibit cyclic patterns such as hog production and pork slaughter, cycles are indicated at ICYC in Step 2 and cycle factor multipliers are entered as VECTORs at Step 10 of MASTER1. Such factors are used by the program to adjust the historical data for the cycles first, then fit the trend to the adjusted data, project this trend of adjusted data, and finally apply the cycle factors for cyclic-adjusted projections to be printed in the output tables. The cycle factors need to be

determined exogenously and inputed as a vector array for the total periods (NI + NP) at Step 10.

No cycle factors are used in PRORATPJ, but of course if cyclic adjusted values are included in the master table, then these same factors are reflected in the corresponding prorate tables.

Master Versus Prorate Projections. For many applications, the user has choice of developing master projections from available historical data, or of developing prorate projections from the same historical data but prorating to more aggregate and reliable master data of which the prorate data are integral parts. Unless there is reason to believe that the historical subtable data are of equal or greater reliability than the more aggregate master tables, the proration method is likely to yield more dependable projections. In any case this method insures internal consistency between projections in the aggregate master table and the sum of component projections in the subtables. This is not necessarily true if the component projections are made as independent master projections.

Illustrative Cases Included in the Manual

It is not feasible to include cases here to illustrate all of the different options provided by the projection programs. After a little experience in using PRORATPJ (and MASTERPJ) the user will be able to see how to introduce modifications in commands to specify options for alternatives of interest. Most of them can be activated by changing a few commands from those given for one of the illustrative cases included in the manual which is most nearly like that which the user desires to formulate.

Four illustrative cases are included. They are PPJCase.One, PPJCase.Two, PPJCase.USe, and PPJCase.Agr.

PPJCase.One. PPJCase.One illustrates relatively straight forward prorations of rice cultivation by district within Chiriqui Province of Panama based on preliminary statistics for 12 of the 13 years included in the corresponding master table. The case include conversion projections for units of hectares, but requires no subtotal categories.

PPJCase.Two. PPJCase.Two illustrates proration projections from Y estimates for 32 categories of farm tractor inventories for a Governorate in Egypt. The estimation function is Y(ijkl) = I(i-1,jkl) + P(ijkl) - S(ijkl), where Y represents the inventory in year i of tractors j of size k and age l, I represents inventory the previous year, P represents tractor purchases and S represents tractor sales during the year. The Y estimates are replaced by reported data for two census years, 1975 and 1980, before making the projections. Proration subtotals are included for two-wheel tractors, four-wheel tractors, and crawler tractors.

PPJCase.USe. PPJCase.USe illustrates proration projections of United States exports of agricultural products by region and country of destination for 1989 through 1993. The master projections (created by a prior run with the companion Master Projection Program) by commodity group are based on long term trends (1960-1988). The prorations of exports of oilseeds and of feeds and fodders to

specific countries of destination are based on reported statistics by the Economic Research Service of the U. S. Department of Agriculture for 1982 through 1988. Proration subtotals are made for (1) East Asia, (2) Americas, (3) Western Europe, (4) Eastern Europe, (5) Middle East, (6) Asian Subcontinent, and (7) Other Areas. Conversion prorations are made to convert from units of 100 metric tons to the more common unit of 1,000 metric tons.

PPJCase.Agr. PPJCase.Agr illustrates the use of PRORATPJ to superimpose transition patterns in development schedules, cropping patterns and crop yields for projected combined net farm income schedules of land development alternatives. It is based on data for medium irrigation schemes in Rajasthan, India.

SECTION IV

BUILDING HISTORICAL DATA FILES FOR THE PRORATIONS

The historical data files which serve as basis for time-trend prorations need to be constructed in tabular form, with one line for each period, starting with the oldest and extending to the most recent. The first two left-most columns of the table are for the sequential designation of the periods and the period identification, respectively. Each input file can contain up to twelve columns of data for the components making up the table. When there are more than eight but less than thirteen columns, the data for columns 9 through 12 are extended to a second line of input immediately following the first line, and in comparable format. When there are more than twelve columns of data, then the historical table is divided into sections or "pages", each carrying the period sequence and identification. For example, a table of historical data on wheat by county in Kansas would need to be divided into at least nine sections or pages, because there are 105 counties in the state. Usually the counties are grouped by crop reporting district or in some other meaningful way when formulating the subtables for an extended prorate table such as one with 105 counties or components. When this is done, time trends can be fitted and projections made for each of the components separately, for meaningful subgroups of the components, and for the total of all components in the data set.

Each "page" in the input data file for the PRORATPJ program is proceeded by two integer values to identify the data set and four column header lines to accompany the data columns in the printed output. The integer values are read in the format of 13X, I4, 5X, I4 to align with the first two data columns of the corresponding data input. The integer identifiers are INUMC, which is the number of columns of data in this "page" of input, and INOIND, which is the total number of columns in the "district" subtotal. The INUMC value can be any number from 1 to 13; the INOIND value is equal to or greater than the corresponding INUMC value, depending upon how many "pages" of components are included in the subtotal.

The four column header lines to accompany each "page" of prorate input data follow the format of the printed output for the tables, i. e., A8, 8(1X,A8) / 5(1X,A8). The first two lines, one of 80 columns followed by one of 45 columns, form the first of the two-line decked column headings for this page of output. The next two lines of input in the same format form the second line of the printed decked headings. Because the A8 space at the left of the format is for period identification, it typically is completed as ' PERIOD ' on the first line and as 'NO. YEAR' on the third line of the column header input. The last column (number 13) normally is reserved for 'TOTAL'. For "pages" which have less than 13 columns of data to identify by column headings, only as many headings as needed will be entered, leaving blank the unused spaces to the right of the format.

Construction of the Input Data File

The historical numbers in the prorate input table are read from the data file of numbers tabulated in a predetermined format and specified order. This tabulation may be thought of as a table of n periods by m components, with the

periods forming the rows and the components the columns the table. Each section or page of the table is up to 80 spaces wide and 60 lines long. The spaces are divided into 3 for the period sequence, 1 blank space, 4 for the period identification, and then eight data fields, each of which is 9 spaces wide. Such tabular format is described as I3, 1X, I4, 8 F 9.0, or in the case of sets with from 9 to 12 data columns, as I3, 1X, I4, 8 F 9.0 / 8X, 4 F 9.0, where I represents integer numbers, F represents floating point or real numbers, X represents spacer, the numbers preceding the letters indicate the number of fields, and the numbers following the letters indicate the number of spaces in each field. The .0 in the floating point field indicates that the decimal point is understood to be at the right edge of the field (0 spaces back to the left of the right edge) unless the decimal point is entered with the data.

To set such format in a spreadsheet software program such as LOTUS 123, one sets the column width of Column 1 to 3, that of Column 2 to 5, and leaves that of the remaining columns at the default value of 9. The type of numbers would be set to integers for the first two columns and to decimal numbers with 0 decimal places for the remaining columns.

This format is illustrated by the following sample page of input consisting of three parts. The first line with the two integer numbers indicates that there are 12 columns of data in this set, and that there is a total of 12 columns in the proration subtotal. The next four lines provide the column headings for the period identification plus the 13 columns of data. The data entries represent the third part of the input. The first line of each period's data has eight columns, and the second line contains the remaining four. There are eleven periods of data. The format represents that followed for the historical data input for the prorate projection program throughout. The period numbers appear in sequence, and continue from the first period to the last one. The period identification may be years as in the example shown, or may be quarters, months or other identification. Quarters would be identified as 0188, etc. and months as 0690, etc., for example. The data by component of the table are entered in as many of the eight plus four fields as needed, each of which is nine spaces wide. If there are eight columns or less in a given data set, then the second line of each period's entry for that data set is omitted.

Period No.	Year	12 First Column	12 Second Column	Third Column	Fourth Column	Fifth Column	Sixth Column	Seventh Column	Eighth Column
	Ninth Column	Tenth Column	Eleventh Column	Twelfth Column					
1	1980	20.	30.	40.	50.	60.	70.	80.	90.
		52.	58.	71.	82.				
2	1981	17.	32.	38.	55.	59.	67.	81.	90.
		55.	59.	67.	81.				
3	1982	18.	31.	38.	54.	61.	69.	79.	92.
		54.	61.	69.	79.				
4	1983	19.	33.	40.	53.	59.	71.	82.	93.
		53.	59.	71.	82.				
5	1984	21.	31.	42.	54.	66.	73.	82.	92.
		54.	66.	73.	82.				

6 1985	23.	33.	44.	54.	65.	75.	84.	95.
	54.	65.	75.	84.				
7 1986	24.	32.	43.	56.	65.	76.	83.	96.
	56.	65.	76.	83.				
8 1987	25.	34.	44.	55.	66.	77.	88.	95.
	55.	66.	77.	88.				
9 1988	24.	34.	45.	56.	66.	78.	87.	97.
	56.	66.	78.	87.				
10 1989	25.	35.	46.	57.	65.	79.	88.	98.
	57.	65.	79.	88.				
11 1990	26.	35.	47.	58.	67.	79.	89.	101.
	56.	68.	78.	90.				

Using EDLIN to Create Input Data Files

The data files to serve as input to PRORATPJ as basis for the projections to be made can be typed with the DOS editor program, EDLIN, or with a data base or word processor program, or they can be created with an electronic spreadsheet program such as LOTUS. Two examples are illustrated in this section, (1) using the line editor program, EDLIN, and (2) using LOTUS 123.

Purpose. One can use the MS-DOS program, EDLIN, to prepare user data input for PPJ (and MPJ) problems. The procedure permits use of one of the text sample problems such as PPJDATA.ONE as format template for the user problem. EDLIN is used to edit the sample problem line by line, thus converting it from the text sample problem to the user data input. Use PPJData.One or PPJData.Two as the format template if the user problem has no requirement for Y-table estimates, for example. Use PPJData.Pan as the pattern if the user problem involves integrated proration projections. Use PPJData.Agr as the pattern for projection problems involving superimposed transition patterns to full development.

Step 1. The first step in preparing the user input data is to print the file you will use to represent the format template, say PPJDATA.ONE. This can be done with the DOS PRINT command directed to the configured PRN device, e.g. PRINT PPJDATA.ONE>PRN and key <Return>. It also can be done by echoing to the printer with <Ctrl> P, using TYPE and <Return>.

Step 2. The second step in preparing the user data input is to assemble the data for entering to the computer with EDLIN. The step must be completed precisely, following the sequential steps one by one, and the exact format of the PPJDATA.XXX (and/or MPJDATA.XXX) template. Step 2 is completed by writing the new data just above the corresponding data as printed on the sample template. Remember that both vertical and horizontal spaces are significant in the template. They should be retained as they are unless specific changes are needed to fit the user problem.

Step 3. Use COPY to transfer the template master to your work disk, e.g., COPY PPJDATA.ONE B: <Return>; use RENAME to rename the file, e.g., REN B:PPJDATA.ONE PPJDATA.NEW and key <Return>.

Step 4. Set up the template file for editing with EDLIN, e.g., EDLIN B:PPJDATA.NEW <Return>. The EDLIN prompt, *, should appear with flashing cursor, _,

in the upper left corner of the screen. To list a reasonable number of lines for the file to appear on the screen, type 1 20 L <Return>.

Step 5. Starting with Line 1, use EDLIN to replace template information and data, proceeding until the entire file is changed. Type 1 to recall line 1; use <F1> to copy a character to the edited line; type in corrections in the appropriate locations. Key <Return> to accept changed line and move to the next line. When the process is completed, type E to accept to the file all changes made with EDLIN.

At points where the PPJDATA.NEW contains several lines of input which are more like the previous line of PPJDATA.NEW than like that on the present line of the PPJDATA.ONE template, it will be faster to move to EDLIN's insert mode by typing the number of the next line, say 23 and I <Return>. Now the previous line of PPJDATA.NEW can be copied with <F1>, <F2> or <F3> and edited as needed as you go. When ready to terminate the insert mode, simply type the next line number followed by <Ctrl> C. Then remaining lines from the PPJDATA.ONE template which are not needed can be eliminated by typing the inclusive numbers to be deleted followed by D, i.e., 46 59 D and <Return>.

Using LOTUS 123 to Create Input Data Files

Introduction. The LOTUS systems disc contains the Software package for creating and manipulating electronic spreadsheets, or LOTUS Worksheets (WKS or WK1). LOTUS Worksheets can be copied into a print file (LOTUS.PRN) so that they are recognized as standard ASCII files for reading as formatted data files by the PPJ and other Fortran programs.

LOTUS is widely used and recognized, and has many uses in its own right, including file management and graphics as well as electronic spreadsheets. Easy to follow references and manuals have been developed by users and are readily available at local book stores. No one will regret investing the time and energy necessary to become familiar with LOTUS. Now using LOTUS to create data files for other programs adds further to the usefulness of this software.

LOTUS Worksheets are keyed by lettered columns and numbered rows like a road map. Data appearing in cells are stored as formulas, even though they appear as numbers in the displayed worksheet, making it easy to up-date the data files by changing a few base numbers in the formulas. Copy, move, erase, insert, change format, adjust column width, and other worksheet manipulations are relatively easy with LOTUS, so that the user is in no way bound to the standard or default spreadsheet pattern. However, because the standard column width in LOTUS Worksheets is nine spaces, it is convenient to use this pattern as basis for input formatting to the Fortran programs like the PPJ.

Creating File Using Illustrative Example. The following example of preparation of the input data file for the PPJ Program shown on page 15 with LOTUS 1-2-3 is designed to give the user an introduction to this software and how to use it. The steps are listed in numbered sequence for reference and use in self instruction.

1. Bring up LOTUS 1-2-3
   a. Type LOTUS <Return>
   b. When the LOTUS options appear in the screen window, place the cursor on 1-2-3 and Key <Return>
   c. Key <Return> again in response to the prompt Press any Key
   *. An alternative short-cut procedure is to type 123 and key <Return> at Step a.

2. Set up LOTUS Worksheet (Column A at 3 spaces wide and Column B at 5 spaces wide, leaving Columns C..G at the standard 9 spaces)
   a. Put Cursor on Column A with arrow key and type / W C S 3 <Return>
   b. Put Cursor on Column B with arrow key and type / W C S 5 <Return>

3. Set the Range Format for the data section to Fixed with Zero places
   a. Type / R F F 0, designate the data range as C5..J26 and <Return>

4. Enter Input Data for Step 1 on Row 1
   a. Put Cursor on C1 cell and type 13 <right arrow> 13 <Return>

5. Enter the Column Headings
   a. Put Cursor on A2 cell and type ' Period -> -> (right arrows) "First -> "Second -> "Third -> "Fourth -> "Fifth -> "Sixth -> "Seventh -> "Eighth <Return>
   b. Put Cursor on A3 cell and type ' Ninth -> -> "Tenth -> "Eleventh -> "Twelfth -> "13th <Return>
   c. Put Cursor on A4 cell and type 'No. Year -> -> "Column -> "Column -> "Column -> "Column -> "Column -> "Column -> "Column -> "Column <Return>
   d. Put Cursor on A5 cell and type ' Column -> -> "Column -> "Column -> "Column -> "Column <Return>

6. Use Data Fill and Insert to fill in the period designations
   a. Put Cursor on A6 cell and type / D F A6..A16 <Return> 1 <Return> 1 <Return> 11 <Return>
   b. Put Cursor on B6 cell and type / D F B6..B16 <Return> 1980 <Return> 1 <Return> 1990 <Return>
   c. Type / W I R A7 <Return>
   d. Repeat Step 6c for lines A9, A11 .. A21.

7. Enter the tabular data from pages 14-15 to Cells C6..J27 using numeric and entry keys. (Enter only numbers, not the decimal points)

8. Save the Worksheet File
   a. Type / F S DATAPPJ <Return> R and wait for save to complete

9. Make and Save the LOTUS Print File
   a. Type / P[rint] F[ile] DATAPPJ <Return>
   b. Type O[ptions] M[argin] L[eft] 1 <Return>
   c. Type M[argin] T[op] 0 <Return>
   d. Type M[argin] R[ight] 132 <Return>
   e. Type O[ther] A[s Displayed] O[ther] U[nformatted] Q[uit]

f. Type R[ange] A1..J27 <Return>
g. Type G[o] and wait for file to be created
h. Type Q[uit] and wait for file to be copied to your disc
i. If you want to preserve the print (file) settings on your diskette with the worksheet file, you may do so by resaving the worksheet file at this point (/ F S <Return> R)

   (You should now have two new files on your disk, DATAPPJ.WKS (or WK1) and DATAPPJ.PRN. The first is a Lotus worksheet which can be used with LOTUS as any other such file. The second is an ASCII data which can be read by PRORATPJ. After backing out of LOTUS, this DATAPPJ.PRN file can be RENamed PPJDATA.RUN to serve as input for running the Prorate Projection Program, PRORATPJ.EXE.

10. Quit LOTUS
    Back out of LOTUS by successive Quit and End commands by typing first letters or by Cursor and <Return>; for example, type
    / Q Y E Y
    The A> or B> signal at the left side of the screen indicates that you are back under DOS control.

SECTION V

USING PRORATE1 TO PREPARE COMMANDS FOR PRORATE PROJECTIONS

Nature and Purpose of PRORATE1

The PRORATE1 Program is a separate computer routine for reading the commands and instructions for making proration projectio.. runs with PRORATPJ. The program reads default values from a disk file, DEFAULT.PRO, reads user commands from keyboard input in response to screen prompts, and creates the command input file for the Prorate Projection Program, INPUT.PPJ.

It should be noted that the file INPUT.PPJ is in the same format as DEFAULT.PRO, so that after one has become familiar with the program, the input can be prepared by editing a copy of DEFAULT.PRO (say with the DOS editor, EDLIN) and then renaming it to INPUT.PPJ for direct reading by that program.

To invoke the PRORATE1, two files are needed on the logged drive together with enough disc space for creation of a third. The needed files to run PRORATE1 are Prorate1.Exe and Default.Pro. Both of these are provided on the master disc supplied with the Proration Projection computer package. The new file to be created by the run is INPUT.PPJ, as indicated above. To initiate the run just type PRORATE1 and key <return>.

The program will bring up a series of screen displays on the monitor, each of which shows the default commands at that step, and prompts the user to enter the comparable commands for his problem. Each provides specific instructions as to the number of digits to be entered at each command and the spacing between commands. These instructions must be followed exactly or the run will not be completed, because the commands are read from the keyboard input in specified format. When the requested input at each step has been provided, one proceeds to the next step by keying <Return>.

Until becoming familiar with the screen prompts and keyboard command entries, the user may find it difficult to enter all of the necessary commands to complete the run without making an error and having to start over. A good way to overcome this kind of problem is to make the entries a few steps at a time, accepting the default values for the remaining steps. For example, new commands might be entered at the steps of the Master Screen, Screen 1 and Screen 2, and from there forward the default values can be accepted by keying a series of <return>s until the program runs and the message "Commands and Headers Now Stored in the INPUT.PPJ File; Proceed to the PRORATPJ Run" appears on the monitor. The output file created by the run, Input.Ppj, then can be RENamed to Default.Pro in preparation for the second pass run with PRORATE1, this time to enter the desired values at Screens 3, 4 and 5, for example. Two or three such passes should permit development of the final Input.Ppj file for running the prorate projections with PRORATPJ. In following this procedure, remember that once a menu has been brought up on the monitor, it is necessary to re-enter the commands shown on that screen, even if they are to remain the same as the default values.

Introductory Screen and Master Menu

Introduction to Use of Proratel

Upon calling PRORATPJ, the first screen to appear is the program introduction shown on the opposite page. The introduction serves to remind the user of the general procedure followed in the program, and outlines the user input required.

The first point reminds us that the program needs the DEFAULT.PRO file from which to read the default command values.

The second point summarizes the read and create procedures of the program.

The third point reminds us of a short-cut procedure for creating INPUT.PPJ if no changes from the DEFAULT.PRO file are needed.

A pause is provided for time to read the Introductory Screen; as indicated the monitor display, just key <return> to continue when ready.

Master Menu for Command Selections

The next screen to appear on the monitor is the Master Menu shown on the opposite page. It represents an index of the different sets of commands used to direct the kinds of projections desired. Entry of a number from 1 to 9 followed by <return> will bring up the corresponding screen. Although the usual practice is to provide the information by screen in numerical sequence, the screens can be selected in any order. In cases for which the default values are to be accepted for all but a few variables on one or two screens, only the number(s) of the screen(s) involved need to be requested from the Master Menu. The default values will be retained for the variables contained on any of the screens not requested by number. It is possible to call the same screen by number more than once if a further change is needed on one or more of the variables contained on that screen.

After making the changes on any of the numbered screens and keying <return>, the Master Screen again will appear on the monitor. When all of the desired changes have been made to the default values, keying <return> to the Master Screen will cause the Program to move on to the next step.

Monitor Display of Program Introduction

PRORATION PROJECTION PROGRAM WITH USER OPTIONS
Professor Richard Phillips
Department of Agricultural Economics
Kansas State University

* This program reads default command instructions from the DEFAULT.PRO disk file for screen display to guide the user in keyboard entry of corresponding commands and information for his problem.

* The program then reads the user-supplied information from the screen and creates the INPUT.PPJ file of this command information for use in the PRORATPJ run.

* The INPUT.PPJ file created by this program follows the same format as the DEFAULT.PRO file. This enables the user who needs to make no changes from the previous commands to simply rename the file (with DOS) rather than using PRORATE1 to build the PRORATE.VAL file for the PRORATEPJ run.

Pause.
Please press <return> to continue.

Monitor Display of Master Menu

COMMAND VALUES TO BE SPECIFIED FOR THE PRORATIONS

Enter Code Number of Menu Selection and Key <return>.

1 Type of Projection Model and Analysis

2 Special Features Invoked for the Run

3 Sequential Order for District Subtotals

4 Intercept and Coefficients for Regression Estimates

5 Control Information for Override Data

6 Transition Factors to Be Superimposed

7 Period by Period Multipliers for Conversion Table

8 Titles and Column Header Lines for Prorate Tables

9 Footnote Lines for the Prorate Tables

SELECTION:
1

Model Designation and Special Features

The monitor displays reproduced on the opposite page are for inputting commands designating the type of projection model, and for invoking one or more of the special features available in the program.

Type of Projection Model and Analysis

```
READ (NREAD,9) ISTATE,IX1,IX2,NK,NFORM,ICYEAR,LPRJ,IREG,ITRANS,
               INOINT,NLANG
```

(Enter a two-digit number for each command)

ISTATE = Column number in the Master table which is to be prorated
IX1 = First exponent on time variable (subtract 1.0 from desired exponent before making entry, e.g., exponent of 1.0 entered as 0)
IX2 = Final exponent on time variable, entered as above. Program will make another set of projections for all exponents between first and final in increments of 0.2

NK = Number of periods of prorate data
NFORM = Form superimposed transitions for master tables (NFORM = 1)
ICYEAR = First year of data in the prorate table
LPRJ = Use natural log rather than exponential proration model

IREG = Regression used to estimate proration data (IREG = 1)
ITRANS = Superimpose time transitions on master projections (ITRANS = 1)
INOINT = Total number of columns in the proration table
NLANG = English = 0, Spanish = 1, French = 2

Commands for Special Features Invoked for the Run

```
READ (NREAD,9) NOLOOP,ISINGL,IFEED,NOMOD,ICARDM,ICARDS
```

(Enter 1 for Yes, 0 for No)

NOLOOP = Number of X variables used to estimate proration Y data
ISINGL = Do not fit relative trend to prorate data
IFEED = Create a conversion proration table from the main one

NOMOD = Omit identifying type of model used in the proration
ICARDM = Make a computer file of the main table proration output
ICARDS = Make a computer file of the conversion table proration output

Monitor Display of Screen 1 for Model Designation

COMMANDS FOR TYPE OF PRORATION MODEL AND ANALYSIS:

Enter two-digit value for each command in succession, with one blank space between entries.

1 COLUMN NUMBER IN THE MASTER TABLE TO PRORATE:	2	(Enter as 2-digit number)
2 FIRST EXPONENT ON THE TIME VARIABLE:	0	(Enter as above)
3 LAST EXPONENT ON TIME VARIABLE:	0	(Enter as above)
4 NUMBER OF PERIODS OF PRORATE DATA:	12	(Enter as above)
5 FORMULATE TRANSITION PATTERNS:	0	(Yes = 01; No = 00)
6 PERIOD OF FIRST DATA FOR PRORATION:	4	(Enter as 2-digit number)
7 USE LOG MODEL FOR PRORATION:	0	(Yes = 01; No = 00)
8 REGRESSION USED TO ESTIMATE PRORATE DATA:	1	(Yes = 01; No = 00)
9 FIT MULTIPLE TRANSITION PROJECTIONS:	1	(Yes = 01; No = 00)
10 TOTAL NUMBER OF COMPONENTS (COLUMNS) TO BE PRORATED TO THE VALUES IN THE MASTER TABLE IN THIS RUN:	17	(Enter as 2-digit number)
11 LANGUAGE CODE: ENG = 0, SPN = 1, FRN = 2	0	(Enter as 2-digit number)

SELECTIONS:

02 00 00 12 00 04 00 01 01 17 00

Monitor Display of Screen 2 for Special Features

COMMANDS FOR SPECIAL FEATURES INVOKED FOR THE RUN:

Enter one-digit integer for each command in succession, with one blank space between entries.

1 NUMBER OF X VARIABLES:	1	(Enter 1 if Y Data Provided Directly)
2 SINGLE YEAR OF PRORATE DATA:	0	(Yes = 1, No = 0)
3 MAKE CONVERSION PRORATE TABLE:	1	(Yes = 1, No = 0)
4 OMIT PRINTING TYPE OF PRORATE MODEL:	1	(Yes = 1, No = 0)
5 CREATE FILE OF PRORATE OUTPUT TABLE:	0	(Yes = 1, No = 0)
6 CREATE FILE OF CONVERSION OUTPUT TABLE:	0	(Yes = 1, No = 0)

SELECTIONS:

1 0 1 1 0 0

District Sequence and Regression Coefficients

Commands for Number and Sequence of Districts

The monitor display reproduced on the opposite page is for inputting commands to indicate the organization of the prorate output tables into groups, e.g., county data into crop reporting districts, with subtotals by group. The commands are given by indicating the number and sequence of the groups by number from the first to the last.

```
READ (NREAD,9) NDIST,(IDIST(I),I=1,10)
    (Enter two-digit numbers with one space between entries)
```

NDIST = Number of subdivisions (districts) to be included
IDIST1 = Number of the first district for subtotals in the proration
IDIST2 = Number of the second district for subtotals in the proration
IDIST3 = Number of the third district for subtotals in the proration

IDIST4 = Number of the fourth district for subtotals in the proration
IDIST5 = Number of the fifth district for subtotals in the proration
IDIST6 = Number of the sixth district for subtotals in the proration

IDIST7 = Number of the seventh district for subtotals in the proration
IDIST8 = Number of the eighth district for subtotals in the proration
IDIST9 = Number of the ninth district for subtotals in the proration
IDIST10 = Number of the tenth district for subtotals in the proration

Listing of Intercept and B Coefficients

If IREG = 0, the first monitor display shown on the opposite page will appear, and only a <return> is needed from the keyboard to continue.

```
IF (IREG.EQ.1) READ (NREAD,511) ATRCEP,(BCOEF(I),I=1,NOLOOP)
  (Enter six character decimals, with one space between entries)
```

ATRCEP = The Y intercept (value of Y when all Xs equal zero)
BCOEF1 = Partial regression coefficient showing impact of X1 on Y
BCOEF2 = Partial regression coefficient showing impact of X2 on Y

BCOEF3 = Partial regression coefficient showing impact of X3 on Y
BCOEF4 = Partial regression coefficient showing impact of X4 on Y
BCOEF5 = Partial regression coefficient showing impact of X5 on Y
BCOEF6 = Partial regression coefficient showing impact of X6 on Y

BCOEF7 = Partial regression coefficient showing impact of X7 on Y
BCOEF8 = Partial regression coefficient showing impact of X8 on Y
BCOEF9 = Partial regression coefficient showing impact of X9 on Y
BCOEF10 = Partial regression coefficient showing impact of X10 on Y

Monitor Display of Screen 3 for District Sequence

NUMBER AND SEQUENCE OF SUBAREAS (DISTRICTS):

Enter two-digit number for each district in succession, with one blank space between entries.

If projections to be prorated are not divided by district, enter 01 in the first field.

```
0  NUMBER OF SUBAREAS (DISTRICTS):   1
1  NUMBER OF FIRST DISTRICT:    0
2  NUMBER OF SECOND DISTRICT:   0
3  NUMBER OF THIRD DISTRICT:    0
4  NUMBER OF FOURTH DISTRICT:   0
5  NUMBER OF FIFTH DISTRICT:    0
6  NUMBER OF SIXTH DISTRICT:    0
7  NUMBER OF SEVENTH DISTRICT:  0
8  NUMBER OF EIGHTH DISTRICT:   0
9  NUMBER OF NINTH DISTRICT:    0
10 NUMBER OF TENTH DISTRICT:    0
```

SELECTIONS:

01 00 00 00 00 00 00 00 00 00 00

Monitor Display of Screen 4 for B Coefficients

If IREG = 0:
PRORATIONS BASED ON HISTORICAL COMPONENT DATA FOR THIS VARIABLE

Pause.
Please press <return> to continue.

If IREG = 1:
Y INTERCEPT AND B COEFFICIENTS FOR THE X VARIABLES:
(Enter 6-character decimal for each value, with one space between them, and then <return)

```
Y INTERCEPT: 0.00000
B1 VALUE:    1.00000
B2 VALUE:    1.00000
B3 VALUE:    1.00000
B4 VALUE:    1.00000
B5 VALUE:    1.00000
B6 VALUE:    1.00000
B7 VALUE:    1.00000
B8 VALUE:    1.00000
B9 VALUE:    1.00000
B10 VALUE:   1.00000
```

SELECTIONS:
0.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0

Information for Override Data and Transition Multipliers

Commands for Periods to Be Overridden

The monitor display reproduced on the opposite page is for inputting information on periods for which override data to the Y estimates are provided (applicable only if IYES = 1).

```
READ (NREAD,9) NOEXCP,(IEXCP(I),I=1,NOEXCP)
(Enter two-digit numbers with one space between entries)
```

NOEXCP = Number of periods for which override data provided
IEXCP1 = Identification of first period of override data
IEXCP2 = Identification of second period of override data

IEXCP3 = Identification of third period of override data
IEXCP4 = Identification of fourth period of override data
IEXCP5 = Identification of fifth period of override data
IEXCP6 = Identification of sixth period of override data

IEXCP7 = Identification of seventh period of override data
IEXCP8 = Identification of eighth period of override data
IEXCP9 = Identification of ninth period of override data
IEXCP10 = Identification of tenth period of override data

Listing of Transition Factor Multipliers

If the proration projections are to reflect a superimposed transition (e.g., increases in crop yields as development progresses), as indicated by ITRANS = 1 at Screen 1, the monitor display at Screen 6 shown on the opposite page will appear. In this case the user is requested to supply the transition multipliers for up to 10 periods.

```
IF (ITRANS.EQ.1) READ (NREAD,511) (FACTOR(I),I=1,10)
(Enter six character decimals, with one blank space between entries)
```

FACTOR1 = Transition multiplier factor for first period from introduction
FACTOR2 = Transition multiplier factor for second period from introduction
FACTOR3 = Transition multiplier factor for third period from introduction

FACTOR4 = Transition multiplier factor for fourth period from introduction
FACTOR5 = Transition multiplier factor for fifth period from introduction
FACTOR6 = Transition multiplier factor for sixth period from introduction

FACTOR7 = Transition multiplier factor for seventh period from introduction
FACTOR8 = Transition multiplier factor for eighth period from introduction
FACTOR9 = Transition multiplier factor for ninth period from introduction
FACTOR10 = Transition multiplier factor for tenth period from introduction

Monitor Display of Screen 5 for Override Periods

```
If IREG = 0:
   REGRESSION ESTIMATES NOT USED, SO THAT OVERRIDE DATA NOT APPLICABLE

Pause.
Please press <return> to continue.

If IREG = 1:
   NO. OF PERIODS OF OVERRIDE DATA, AND IDENTIFICATION OF THESE PERIODS
     (Enter as two-digit numbers with one space between entries)

NUMBER OF PERIODS FOR WHICH OVERRIDE DATA PROVIDED: 02
FIRST PERIOD OF OVERRIDE DATA:                      03
SECOND PERIOD OF OVERRIDE DATA:                     08
THIRD PERIOD OF OVERRIDE DATA:                      00

FOURTH PERIOD OF OVERRIDE DATA:                     00
FIFTH PERIOD OF OVERRIDE DATA:                      00
SIXTH PERIOD OF OVERRIDE DATA:                      00
SEVENTH PERIOD OF OVERRIDE DATA:                    00

EIGHTH PERIOD OF OVERRIDE DATA:                     00
NINTH PERIOD OF OVERRIDE DATA:                      00
TENTH PERIOD OF OVERRIDE DATA:                      00

SELECTIONS:
02 03 08 00 00 00 00 00 00 00 00 00 00
```

Monitor Display of Screen 6 for Transition Factors

```
Applicable if ITRANS = 1:
  MULTIPLIER FACTORS FOR SUPERIMPOSED TRANSITION:

  (Enter 6-character decimal for each factor, with one blank space
  between them, and then <return>)

  1ST PERIOD: 0.05000
  2ND PERIOD: 0.15000
  3RD PERIOD: 0.25000

  4TH PERIOD: 0.40000
  5TH PERIOD: 0.60000
  6TH PERIOD: 0.90000

  7TH PERIOD: 1.00000
  8TH PERIOD: 1.00000
  9TH PERIOD: 1.00000
 10TH PERIOD: 1.00000

SELECTIONS:
0.0500 0.1500 0.2500 0.4000 0.6000 0.9000 1.0000 1.0000 1.0000 1.0000 1.0
```

Multiplier Factors for Making Conversion Prorate Table

Listing of Conversion Factors for First Periods

```
READ (NREAD,105) IFIRST,CONST,IYEAR,CONVRT(2)
(Enter period as two-digit integer and multiplier as
six-character decimal, with one blank space between entries)
```

IFIRST - First period for application of conversion factor
CONST - Multiplier for making first period conversion
IYEAR - Second period for application of conversion factor
CONVRT2 - Multiplier for making second period conversion

Conversion Rates if IFEED (Screen 2) = 1 and IYEAR (Screen 7) NE 0

When 1 is inserted for IFEED at Screen 1 and a nonzero value is inserted for IYEAR at Screen 7, the Program will bring up the screens shown on the opposite page, requesting that conversion rates be entered for each projection period. To accept the default conversion rate for a given period, simply key <return>; to change the rate, type the decimal value (e.g., 0.033) and then <return>.

When conversion rates are inserted, PRORATPJ will use such rates to produce a conversion prorate table from the corresponding main proration table. In doing so the same conversion factor for a given period is applied uniformly to all columns in the proration table.

Monitor Display of Screen 7 Conversion Factors for First Two Years

```
MULTIPLIERS FOR FIRST TWO PERIODS OF CONVERSION PRORATE TABLE:

    Enter the period as two-digit integer and multiplier as 6-character
    decimal value, with one blank space between entries, and <return>.

FIRST PERIOD FOR APPLICATION OF CONVERSION FACTOR:    6

MULTIPLIER FOR MAKING 1ST CONVERSION:  10.000

SECOND PERIOD FOR APPLICATION OF CONVERSION FACTOR:   7

MULTIPLIER FOR MAKING 2ND CONVERSION:  10.000

SELECTIONS:

06 10.000 07 10.000
```

Monitor Display of Conversion Rates

```
  THE DEFAULT MULTIPLIER FOR PERIOD    8 IS  10.000

    Enter the correct value as a 6-character decimal number,

    followed by <return>.

SELECTION:
10.000

  THE DEFAULT MULTIPLIER FOR PERIOD    9 IS  10.000

    Enter the correct value as a 6-character decimal number,

    followed by <return>.

SELECTION:
10.000

  THE DEFAULT MULTIPLIER FOR PERIOD   10 IS  10.000

    Enter the correct value as a 6-character decimal number,

    followed by <return>.

SELECTION:
10.000
```

Titles and Footnotes

Title Lines

As indicated by the screen on the monitor at this step, the user has two choices, (1) to retain the default title lines, or (2) to insert new ones in the place of the default listings. The first choice is indicated by typing 1 and <return>; the second choice is indicated by typing 0 and <return> or merely <return>.

When the second option is selected, then a series of lines must be typed from the keyboard, each followed by <return>. The order for these entries is as follows:

1. Two title lines to be printed as the first 120-column line of the main output table title.
2. Two title lines to be printed as the second 120-column line of the main output table title.
3. Two title lines to be printed as the third 120-column line of the main output table title.
4. Two title lines to be printed as the fourth 120-column line of the main output table title.
5. Two title lines to be printed as the fifth 120-column line of the main output table title.

If a conversion table were ordered in the run (IFEED = 1), the screen would request four additional title lines as follows:

1. Two title lines to be printed as the first 120-column line of the conversion output table title.
2. Two title lines to be printed as the second 120-column line of the conversion output table title.

Footnotes

Again at this step, the user has two choices, (1) to retain the default footnotes, or (2) to insert new ones in the place of the default listings. The first choice is indicated by typing 1 and <return>; the second choice is indicated by typing 0 and <return> or merely <return>.

When the second option is selected, then a series of lines must be typed from the keyboard, each followed by <return>. The order for these entries is as follows:

1. Two footnote lines to be printed as the first 120-column line of the footnote(s) for the main (and conversion) prorate table.
2. Two footnote lines to be printed as the second 120-column line of the footnote(s) for the main (and conversion) prorate table.

Monitor Display of Title Screen

TITLE AND HEADER LINES FOR MAIN PRORATE TABLE:

Enter ten 80-column lines with <return> at the end of each one.

To bypass typing prorate table titles and headers and accept the default ones instead, type 1 for Bypass and <return>; otherwise type 0 and <return> or just <return> and proceed to type title lines.

TABLE 3B. AREA PLANTED TO FIRST HARVEST RICE IN PANAMA

(UNIT = 10 HECTARES)

PER YEAR 1979-1988, WITH PROJECTIONS THROUGH 1997

DISTRICT IN CHIRIQUI PROVINCE

SELECTIONS:

1

Monitor Display of Footnotes Screen

FOOTNOTE LINES FOR THE PRORATE TABLES

Enter four lines (for two footnotes of up to 132 characters) with <return> at the end of each line.

To bypass typing the footnote lines and accept the default ones instead, type 1 (for bypass) and <return>; otherwise type 0 and <return> or just <return> and proceed to type footnote lines.

ESTADISTICA PANAMENA, INFORMACION AGROPECUARIA, SUPERFICIE SEMBRADA Y PRODUCCION DE ARROZ, MAIZ Y FRIJOL, 1979-1988.
DIRECCION DE ESTADISTICA Y CENSO, PRELIMINARY DISTRICT ESTIMATES.

SELECTIONS:

1

Program Execution

Proceed to Program Execution by Keying <Return>

The last screen to appear on the monitor before the Input.Mpj file is created is the Execution Screen illustrated below. As the screen indicates, the information supplied via the keyboard at Screens 1 through 4 as well as at any of the special screens for the b values, periods of override data and conversion rates, and the title and footnote screens, will be incorporated in the output file.

Also as the screen indicates, it is to be noted that if more than one data set is included in the accompanying PPJDATA.RUN file, the needed identification of number of columns in each set, and in the total for the proration table together with the header lines for each set will be included in the PPJDATA.RUN file rather than in the Input.PPJ file.

Monitor Display of Execution Screen

PROGRAM WILL NOW READ THE HISTORICAL DATA AND MAKE THE PRORATIONS

The data input is read from the disk file, PPJDATA.RUN, in the format I3, 1X, A4, 8F9.0. Each data set is preceded by the INUMC and INOIND information and four lines of headers for that page of output.

If override data are provided, they are included with the X1 input data, and are in the same format.

Information should be included for all INOINT columns to be included in the proration as indicated at Step 2.

To proceed, be sure the file just made with PRORATE1, Input.PPJ, is on the same disk with PRORATPJ.EXE and your OUTPUT.MPJ and PPJDATA.RUN files, and then simply type PRORATPJ and <return>.

Key <return> to go on.

Pause.
Please press <return> to continue.

Normal Completion of PRORATE1 Program Run

Following the keying of 0 and <return> or only <return> at the Execution Screen, PRORATE1 will proceed to create the disk file, Input.PPJ, for the user's problem. It should be noted that if an existing Input.PPJ file is present on the disk in the active drive which should be saved, such file should be RENamed, say to Input.1ST, before making the PRORATE1 run. Otherwise it will be lost when the new file is written over it.

When the run has been satisfactorily completed the following message will appear on the monitor:

Commands and Headers Now Stored in the INPUT.PPJ File;
Proceed to the PRORATPJ Run

Following this, the standard end of run message inserted by the FORTRAN compiler will appear, namely:

Stop - Program terminated.

The complete listing of the Fortran source program for PRORATE1 is included in Appendix A of the Manual. As indicated by the comment lines starting with line 61, the sequence of major steps executed by the program is as follows:

1. Read commands and values from the Default.Pro File.
2. Read command values from the screen.
3. Read titles and footnotes for output tables.
4. Create the command file, Input.PPJ, for the run.

SECTION VI

USING PRORATPJ TO DEVELOP PROJECTED PRORATE TABLES

Once the data file for the projection problem (PPJDATA.RUN) has been completed as described in Section IV, and the commands and headers entered to create the INPUT.PPJ as outlined in Section V, the prorate projections are made by calling the PRORATPJ Program. In order to complete the run the four active disk files, PRORATPJ.EXE, OUTPUT.MPJ, PPJDATA.RUN, and INPUT.PPJ, need to be on the logged disk drive. When the files are in order, and if needed space is provided for the additional files, the prorate projections are made by preparing your printer and then keying PRORATPJ and <Return>.

Sequence of Steps Followed by the PRORATPJ Program

The PRORATPJ Program goes through a sequence of 13 distinct steps in making the requested prorate projections. The basic steps for reading the input (Steps 1 to 6), for fitting the projections (Steps 7, 8 and 13), and for printing the prorate tables (Steps 11 and 12) are completed in all runs. The optional steps (Steps 9 and 10) each will be executed in sequence in response to the call for that option, but will be bypassed if no call is given in the INPUT.PPJ file.

The sequence of steps followed by the PRORATPJ Program is as follows:

1. Read the basic parameters for all problems in the run from OUTPUT.MPJ.
2. Read the control files from the OUTPUT.MPJ file created by MASTERPJ.
3. Read the master table title and footnote file from OUTPUT.MPJ.
4. Read the master table projections from the OUTPUT.MPJ file.
5. Read the control commands for the prorate subtables from INPUT.PPJ.
6. Read the subtotal prorate data from PPJDATA.RUN.
7. Compute the historical data in the proration tables.
8. Fit the proration projections.
9. Make the conversion prorate tables, if ordered (IFEED = 1).
10. Formulate transition patterns, if ordered (NFORM = 1 and/or ITRANS = 1).
11. Print headings for the main and conversion tables.
12. Print the main (and conversion) prorate tables.
13. Force subtable projections to master table totals.

Within each of the variables and routines to be completed in a given run, the program will first produce the main proration table, and then the corresponding

conversion table, if ordered. In the case of projections which include several pages to encompass the total proration table, the first page, including conversions where ordered, will be completed first, followed by the second page, then the third page, and so on until all pages are completed. In case of exponential prorations which are to be fitted with more than one exponent, all requested tables for the first exponent will be completed first, and then the program will proceed to complete all requested tables for the second exponent, and so on through the complete set of exponents requested.

In problems for which prorate Y-estimates are made as a function of one or more projected independent variables, the historical period calculations are completed for each X variable in succession and then for the Y-estimate output. After the Y estimates for the historical period have been made, the program proceeds to fit these to the master table total, and then to fit the proration projections in the usual manner.

The complete listing of the Fortran source program for PRORATPJ is included in Appendix B of the Manual. It will be noted that a short main program is used to establish the maximum row and column dimensions for the problem, and that most of the functions of the program are performed by the PPJ Subroutine. Separate subroutines are used fit the prorate tables to the master table total, to fit the time-trend regressions, and to print the table title and column headings.

Screen Display by PRORATPJ

Only one screen is displayed on the monitor by PRORATPJ in the process of generating the prorate projections requested in the run. It outlines the key features and procedures of the program, reminds the user that changes in the commands for the run need to be made in another run with PRORATE1 to modify the INPUT.PPJ file, and asks for input from the keyboard. A single digit number is requested from the user to indicate how many columns in the master table are to be used as the total column for proration into components in the run. When the number is entered and followed by <return>, the program will proceed directly to execution.

The screen display by PRORATPJ is shown on the opposite page. In this example the number of columns to be prorated is 1.

PRORATION PROJECTION PROGRAM WITH USER OPTIONS
Professor Richard Phillips
Department of Agricultural Economics
Kansas State University

* This program reads master table information from the OUTPUT.MPJ file, command information from the INPUT.PPJ file and historical proration data for n periods from the users disk file PPJDATA.RUN (prepared in LOTUS 123 print file format).

* The program fits mathematical time trends with specified model and prorates the components to the master projection.

* Command options can be changed by keyboard input and saving the changes using the companion PRORATE1 program to modify the INPUT.PPJ file.

* The various prorate options under the program are controlled by keyboard commands supplied by the user with PRORATE1 in response to Menu prompts.

Number of different columns in the Master Table to be prorated in this run: (Enter one-digit integer, e.g., 3, and <return>)

SELECTION:

1

Listing of the Source Program

The complete listing of the Fortran source program for PRORATPJ is included in Appendix B of the Manual. The program consists of 797 statement lines, including comment statements designated by C in the first column. Components of the program include the Main Program, Subroutine PPJ, Subroutine REG, Subroutine Prorate, and Subroutine Tables. The program was compiled with the Microsoft Heath Compiler and linked with the ALTMATH Fortran Math Library. An 8087 coprocessor chip is not required to run the program.

Main Program. Statements 1 through 47 represent the main program for setting up the dimensions for the problem and establishing how many different columns in the master table are to be prorated to components in this run. The Main Program calls the PPJ Subroutine, which does most of the proration computations.

Subroutine PPJ. The PPJ Subroutine is the principal "work horse" of PRORATPJ, encompassing statements 48 through 587. The first part at statements 48-96 dimensions the problem, specifies common arrays and designates the read and write formats used by the program. The second part at statements 97-178 reads the information and data for the master table from the OUTPUT.MPJ file created by the prior run with MASTERPJ.

Statements 179 through 227 read the commands from the INPUT.PPJ file and set up the proration problem for projection. The file is opened by statement 179, and Subroutine PRORATE is called to read the commands by statement 194. Statements 224 through 315 read the prorate data from the PPJDATA.RUN file. This file is opened by statement 228, the number of columns and column headings are read at statements 242-265, and the data are read at statements 267-315.

Statements 316-353 compute the historical numbers in the prorate tables by fitting to the corresponding period in the designated column of the master table. Statements 354-394 fit the proration projections, calling Subroutine REG at statement 372. Statements 395-433 impose zero lower limits and/or fit the superimposed transition when the options are requested.

The prorate output tables are printed at statements 434-498 of the PPJ Subroutine. Subroutine TABLES is called at statement 440 to print the titles and headings; the tabular output is printed at statements 486-498, and the statistical parameters are printed at statements 501-507.

The last section of Subroutine PPJ, statements 523-587, forces the subtable projections to the master table totals, adding one digit to the prorations so as not to lose significance in the printed figures.

Subroutine REG. The REG Subroutine appears at statements 586-636 in Appendix B. The subroutine is called to fit the prorate projections. It applies a linear least-squares algorithm in double precision to basic data as converted to exponential values, natural logarithms, etc., depending on the proration model selected.

Subroutine PRORATE. The PRORATE Subroutine is listed at statements 637-727, and reads the command values for the proration from the INPUT.PPJ file created with the prior PRORATE1 run.

Subroutine TABLES. Subroutine TABLES (LAP,LONVEC,LOTVEC) prints the table titles and column headings for each page of tabular output for the prorations. It comes at statements 728-797 of the PRORATPJ source program.

SECTION VII

PROJECTIONS OF RICE CULTIVATION BY DISTRICT IN PANAMA (PPJCASE.ONE)

Concept of Prorate Projection Analysis

As discussed in Section II (pages 5-8), the concept of prorate time-trend projection analysis parallels that of master projection analysis except that in the case of PRORATPJ, formal techniques are used to force the sum of the components to equal the master total, both for the historical period and for the projected period. The program first converts the historical prorate input data into percentages of the corresponding total to which they should add. It next fits a statistical time trend to these relative percentages as they have existed through time, and then projects the relative percentages into the future, making an internal work table of these percentages.

At the projection step the program imposes the rule of no negative component percentages, setting any such values equal to zero, and distributing the difference proportionally among the other components so that the percentage values always sum to 100.00 percent for each historical and projected period. Finally, to develop the proration projections which sum exactly to the specified column in the master table, the program need only apply the period by period percentages in the internal work table to the figures in that column of the master table to obtain the values for the printed prorate tables. In order to retain significant digits in the proration process, the program automatically multiplies the figures in the master table column by 10 before applying the proration percentages for the prorate output table. For this reason, the units in the prorate table represent those of the corresponding master table adjusted by a factor of 10.

Often the kinds of data needed as basis for proration are incomplete and/or unreliable. In some instances, they are available only in years of special census -- say every five years. In such cases, it may be possible to estimate the values for proration as functions of one or more related variables which are reported in available statistical publications. This option is implemented by setting IREG[ression] at Step 1 = 1 and providing the intercept and regression coefficients at Step 4. Then in those census years when observed values for the Y variable are available, such values can be indicated as override data at Step 5 of PRORATPJ. As pointed out in Section II, these and other options of the proration program are entered through the separate keyboard read program, PRORATE1.

The time-trend model options of linear, logarithm or exponential functions in MASTERPJ also are available in PRORATPJ for fitting trends to the relative percentages. However, it should be noted that the type of model used in the master projection carries through to the prorate projections when the linear model is used at the prorate level. For example, if the master model is exponential at 1.2, and the same exponential trend is intended for the prorate projections, the prorate model should be linear (1.0). If a prorate model of 1.2 is used in this case, the actual exponential model for the individual columns in the prorate table is 1.4. Thus in the usual case of applications for prorate projections, the model specification in PRORATPJ is linear (IX1 and IX2 at Step

1 = 0), and the type of model is not specified on the prorate output tables (NOMOD at Step 2 = 1).

It will be noted that the statistical parameters shown at the bottom of proration output tables reflect the percentage units in which the relative trends were fitted (see Table 3B on page 45, for example).

Description of the Case

The PPJCASE.ONE involves prorate projections of rice cultivation by district within Chiriqui Province of Panama through 1997. The case is related directly to the MPJCASE.PAN described in Section IX of the companion manual, Regression Projection Programs with Multiple Options for Use on MS-DOS Micro-computers, A. Master Projections.

The MASTERPJ problem is structured with logarithmic projections of average yields for the first harvest as X1, exponential (1.3) projection of rice areas as X2, and the product of these two for estimates of rice production as Y. Charts of yield trends are made for the country as a whole and for two provinces, one with increasing yields and one with decreasing yields. Area trends are charted for two master columns, Los Santos Province with declining areas and Cocle Province with increasing production areas for rice. A table of regression trend estimates is prepared for the harvested areas. An OUTPUT.MPJ file is developed in that run for use with the PRORATPJ program to project prorations of rice cultivation down to the district level.

The PRORATPJ problem is structured for 17 districts in one province (Chiriqui) based on preliminary data for 12 of the 13 years included in the corresponding master table. Prorate projections are printed as two tables, the first 12 districts in the first one and the remaining 5 plus the province totals in the second. Prorate conversion tables are made to convert the area prorations from units of 10 hectares to units of hectares.

Options of PRORATPJ which are exercised in the projections reported here include the following:

1. Prorate to Chiriqui Province in the master table (ISTATE at Input.PPJ Step 1 = 2), starting with 1977 (ICYEAR at Input.PPJ Step 1 = 4).

2. Make conversion tables of the prorate projections (IFEED at Input.PPJ Step 2 = 1 and CONST at Step 6 = 10.0).

3. Omit printing type of projection model on prorate tables (NOMOD at Input.PPJ Step 2 = 1).

4. Create a computer file of the main prorate table output (ICARDM at Input.PPJ Step 2 = 1).

5. Do not make subtotals by crop reporting district or other subareas (IDIST1 at Input.PPJ Step 3 = 1).

6. Put 12 districts and no total on the first page of prorate output (PRORATPJ Step 11 command for the first set of prorate input data = 12 17).

7. Put 5 districts and the province total on the second page of prorate output (PRORATPJ Step 11 command for the second set = 5 17).

The data and results for the case are presented on the following pages in the standard order followed throughout the manual, namely:

1. Image of the MASTERPJ computer file output, OUTPUT.MPJ, created in the MASTERPJ run.

2. Reproduction of the file of PRORATPJ input commands and titles for the run, INPUT.PPJ.

3. Reproduction of the proration data input file for the run, PPJDATA.RUN.

4. The primary output prorate table for the first page of prorate output, Table 3B, in units of 10 hectares.

5. The output conversion table for the first page of prorate output, Table 3C, in units of hectares.

6. The primary output prorate table for the second page of prorate output, Table 3B, in units of 10 hectares.

7. The output conversion table for the second page of prorate output, Table 3C, in units of hectares.

8. Reproduction of the computer file, OUTPUT.PPJ, showing the output data for the primary proration table, which was requested in the run.

MASTERPJ Program Output for the Case

The computer file of the output from the MASTERPJ run described in Section VIII of the companion Master Projection Manual, OUTPUT.MPJ, serves as basis for the proration projections. As indicated by the reproduction of the file shown below, the master projections of rice cultivation areas in Panama include all provinces and the national total; any of the province totals could be prorated into components as has been done for Chiriqui Province in this PPJCase.One.

It also will be noted that the OUTPUT.MPJ file includes command codes and information as well as the accompanying title, headers and footnotes for the master projections from which prorations are to be made. All of this information together with the master projections is written to computer file by MASTERPJ in response to the JCOUTY command, and is read by PRORATPJ as a first step toward setting up and projecting the prorations which have been requested.

```
50  70   2   1   0   2   1
13  13   3   3   9  11   3   3   2   0   0   2   0   0   0   0   0   1   1
 2   8   1
 1   9
```

AMA, FIRST CROP

TABLE 3A. AREA PLANTED TO RICE IN PAN

(UNIT = 100 HECTARES)

THROUGH 1997

PER YEAR 1976-1988, WITH PROJECTIONS

PERIOD NO.	YEAR	BOCAS DEL TORO COLON	DARIEN	PANAMA CHIRIQUI TOTAL	VERAGUAS	HERRERA	LOS SANTOS	PROVINCE COCLE	PANAMA
ESTADISTICA PANAMENA, INFORMACION AGROPECUARIA, SUPERFICIE SEMBRADA Y PRODUCCION DE ARROZ, MAIZ, Y FRIJOL, 1976-1988. DIRECCION DE ESTADISTICA Y CENSO.									
3	1976	3.	151.	228.	71.	94.	77.	74.	23.	16.
4	1977	2.	162.	247.	70.	98.	98.	89.	29.	18.
5	1978	4.	181.	266.	77.	106.	100.	82.	28.	21.
6	1979	7.	171.	256.	86.	127.	95.	101.	32.	33.
7	1980	9.	221.	274.	118.	127.	112.	126.	39.	36.
8	1981	5.	232.	358.	116.	117.	135.	127.	40.	43.
9	1982	5.	226.	356.	113.	120.	131.	132.	49.	49.
10	1983	5.	248.	369.	97.	105.	127.	118.	40.	46.
11	1984	3.	222.	310.	116.	114.	172.	110.	38.	38.
12	1985	4.	261.	300.	95.	102.	186.	90.	36.	38.
13	1986	5.	226.	197.	63.	68.	178.	63.	19.	12.
14	1987	5.	213.	186.	53.	65.	178.	67.	22.	12.
15	1988	5.	266.	216.	52.	75.	208.	86.	22.	12.
16	1989	5.	271.	248.	73.	76.	218.	86.	28.	24.
17	1990	5.	281.	244.	71.	72.	231.	85.	27.	23.
18	1991	5.	291.	239.	68.	68.	245.	83.	27.	22.
19	1992	5.	301.	235.	66.	63.	258.	81.	26.	22.
20	1993	5.	311.	231.	64.	59.	272.	79.	25.	21.
21	1994	5.	321.	226.	61.	54.	286.	77.	25.	20.
22	1995	5.	331.	221.	59.	50.	301.	75.	24.	19.
23	1996	5.	342.	216.	56.	45.	315.	73.	23.	18.
24	1997	5.	352.	212.	53.	41.	330.	71.	22.	17.

Commands and Headings for the Case (Input.PPJ)

The INPUT.PPJ file of commands, information and titles for the case as created by PRORATE1 is reproduced below. As described in Section V, the file is created from keyboard commands in response to program prompts displayed on the monitor screen. As the starting point, a set of default values is read from the DEFAULT.PRO file in the same order and format as the INPUT.PPJ file.

The first three lines of integer commands in the accompanying file are common to the INPUT.PPJ file for all proration problems. The number and content of the remaining lines of integer and real number commands are functions of the responses indicated on the first three. In this simple prorate example, only the codes and conversion factors for the conversion prorate table are needed before coming to the listing of the titles and footnotes for the proration tables in the command file. In this example, this listing includes ten title lines for the primary proration table plus four title lines for the conversion table followed by the four lines of footnotes for the output tables.

```
2   0   0  12   0   4   0   0   0  17   0
0   0   1   1   1   0
1   0   0   0   0   0   0   0   0   0
              4   10.0
              0    0.0
```

ANAMA TABLE 3B. AREA PLANTED TO FIRST HARVEST RICE IN P

(UNIT = 10 HECTARES)

997 PER YEAR 1979-1988, WITH PROJECTIONS THROUGH 1

DISTRICT IN CHIRIQUI PROVINCE

PANAMA TABLE 3C. AREA PLANTED TO FIRST HARVEST RICE IN

(HECTARES)

ESTADISTICA PANAMENA, INFORMACION AGROPECUARIA, SUPERFICIE SEMBRADA Y PRODUCCION DE ARROZ, MAIZ Y FRIJOL, 1979-1988.
DIRECCION DE ESTADISTICA Y CENSO, PRELIMINARY DISTRICT ESTIMATES.

Proration Input Data for the Case

The accompanying listing of the PPRDATA.RUN file for the Panama rice cultivation case was developed by the user with EDLIN or with LOTUS in the manner described in Section IV. Even though a relatively simple example with only two sets of proration input data, this first PPJCase illustrates the pattern for the proration input file for all proration projections with PRORATPJ.

In this example, the integer line of the first data set indicates 12 components (i.e., districts) in the set and 17 components in the total (subtotal). The header lines identify these 12 components for which the proration data follow immediately below.

The integer line of the second data set for the proration indicates 5 components in the set and again 17 components in the total. The five are identified by the accompanying header lines which precede the proration data for this set.

```
                12        17
 PERIOD

NO. YEAR      FIRST     SECOND     THIRD    FOURTH     FIFTH     SIXTH   SEVENTH
  EIGHTH       NINTH     TENTH  ELEVENTH    TWELFTH
 1            195       142        63       95        183       451       229       229
 1             27       146       517      251
 2            220       128        59       87        192       470       207       207
 2             26       140       516      240
 3            235       128        57       86        193       469       208       211
 3             39       156       565      242
 4            194       149        60       89        224       403       200       203
 4             45       224       600      251
 5            144       107        47       67        171       302       151       151
 5             37       158       475      208
 6            157       117        62       77        167       287       136       139
 6             31       167       404      225
 7            195       172        91      110        218       357       166       166
 7             32       221       523      299
 8            259       230       117      142        244       386       196       179
 8             28       273       588      227
 9            273       292       135      169        273       414       201       169
 9             31       314       643      276
10            302       407       135      141        240       361       217       161
10             23       312       588      263
11            357       333       159      194        263       353       185       181
11             30       305       488      242
12            316       318       144      181        294       366       181       211
12             33       290       484      242
```

PERIOD NO.	YEAR	13TH	14TH	15TH	16TH	17TH	PROVINCE TOTAL
1		316	318	144	181	294	
2		357	333	159	194	263	
3		302	407	135	141	240	
4		273	292	135	169	273	
5		259	230	117	142	244	
6		195	172	91	110	218	
7		157	117	62	77	167	
8		144	107	47	67	171	
9		194	149	60	89	224	
10		235	128	57	86	193	
11		220	128	59	87	192	
12		195	142	63	95	183	

Primary Table and Conversion Table Prorations

The four accompanying proration tables represent the two-page primary proration output plus the corresponding conversion prorations (in this case the primary prorations multiplied by a factor of ten to convert to units of hectares). The values for all 17 districts are prorated to one column of historical and projected hectarages in the master table, that for Chiriqui Province.

The primary proration tables include the statistical parameters for each of the columns included in the prorations to the master table. These parameters (y-bar, b, r-squared, Syz and Sb) are based on the trend of that column as a percentage of the column in the master table (in this case Chiriqui Province). For example, the parameters for the first column in Table 3B are .06608, .00347, .72931, .008, and .00067, respectively. That is, this district on average represented about 6.61 per cent of the Chiriqui Province total, and this percentage is increasing by 0.347 per cent per year. The trend regression explains about 85 per cent (square root of .72931) of the year-to-year variation around the 6.61 per cent mean. The Syz is .008 compared to the standard error of estimate (Sb) of .00067, indicating statistically significant fit of the regression equation for this district.

The province totals appear on the second page of the primary (and conversion) proration tables. These totals are obtained by horizontal summation across the 17 district components, and serve as a check against the column in the master table to which they are prorated. For example, note that the totals on page 48 represent the values for Chiriqui Province in the master table (second column, page 42) times 10; e.g., in 1977 the value of 1622 = 162 X 10, in 1978 the value of 1810 = 181 X 10, in 1997 the value of 3518 = 352 X 10, etc. In this particular case because the conversion proration table equals the primary proration table X 10, the totals in the conversion table equal the values for Chiriqui Province X 100; e.g., the value in 1977 on page 49 of 16,199 hectares = 162 X 100, the unit of measure in the master table.

TABLE 3B. AREA PLANTED TO FIRST HARVEST RICE IN PANAMA
(UNIT = 10 HECTARES)

PER YEAR 1977-1988, WITH PROJECTIONS THROUGH 1997

PERIOD NO.	YEAR	DISTRICT IN CHIRIQUI PROVINCE											
		FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	EIGHTH	NINTH	TENTH	ELEVENTH	TWELFTH
4	1977	84	61	27	41	78	193	98	98	12	63	222	108
5	1978	105	61	28	41	92	224	99	99	12	67	246	114
6	1979	105	57	26	39	87	210	93	95	17	70	253	109
7	1980	113	87	35	52	131	235	117	119	26	131	350	147
8	1981	111	82	36	52	132	233	116	116	29	122	367	160
9	1982	129	96	51	63	137	235	112	114	25	137	331	185
10	1983	155	136	72	87	173	283	132	132	25	175	414	237
11	1984	169	150	76	93	159	252	128	117	18	178	383	148
12	1985	182	195	90	113	182	277	134	113	21	210	430	184
13	1986	177	239	79	83	141	212	127	95	14	183	345	154
14	1987	201	188	90	109	148	199	104	102	17	172	275	137
15	1988	225	226	102	129	209	260	129	150	23	206	344	172
16	1989	240	269	119	138	212	252	135	125	22	252	406	193
17	1990	259	296	131	151	226	254	138	127	23	274	421	201
18	1991	278	325	144	164	241	257	142	129	23	297	435	208
19	1992	297	354	156	178	256	258	144	131	24	320	449	215
20	1993	315	382	168	190	270	257	146	131	24	341	459	221
21	1994	333	411	181	203	284	255	148	132	24	364	470	227
22	1995	351	439	193	216	297	253	149	132	24	386	479	232
23	1996	370	469	206	229	311	251	151	132	24	409	489	237
24	1997	388	498	219	242	325	247	151	131	24	431	497	242
Ybar		.06608	.05820	.02623	.03340	.06233	.10796	.05315	.05164	.00906	.06327	.14999	.07001
b(%)		.00347	.00631	.00272	.00271	.00243	-.00233	-.00053	-.00084	-.00012	.00456	-.00004	.00018
rsq		.72931	.81226	.88472	.82333	.81637	.61417	.25905	.32205	.04346	.87276	.00011	.00489
Syz		.00800	.01147	.00371	.00475	.00435	.00697	.00338	.00462	.00213	.00658	.01552	.00988
sb		.00067	.00096	.00031	.00040	.00036	.00058	.00028	.00039	.00018	.00055	.00130	.00083

ESTADISTICA PANAMENA, INFORMACION AGROPECUARIA, SUPERFICIE SEMBRADA Y PRODUCCION DE ARROZ, MAIZ Y FRIJOL, 1979-1988.
DIRECCION DE ESTADISTICA Y CENSO, PRELIMINARY DISTRICT ESTIMATES.

Conversion Prorations for Districts 1 to 12

TABLE 3C. AREA PLANTED TO FIRST HARVEST RICE IN PANAMA (HECTARES)

PER YEAR 1977-1988, WITH PROJECTIONS THROUGH 1997

PERIOD NO.	YEAR	DISTRICT IN CHIRIQUI PROVINCE											
		FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	EIGHTH	NINTH	TENTH	ELEVENTH	TWELF
4	1977	835	608	270	407	784	1932	981	981	116	626	2215	107
5	1978	1048	610	281	415	915	2240	986	986	124	667	2459	114
6	1979	1054	574	256	386	865	2103	933	946	175	699	2533	108
7	1980	1133	870	350	520	1308	2354	1168	1186	263	1308	3504	146
8	1981	1110	824	362	516	1318	2327	1163	1163	285	1217	3668	160
9	1982	1288	960	509	632	1370	2354	1116	1140	254	1370	3314	184
10	1983	1545	1363	721	872	1727	2829	1315	1315	254	1751	4144	236
11	1984	1689	1500	763	926	1591	2517	1278	1167	183	1780	3834	148
12	1985	1824	1951	902	1129	1824	2766	1343	1129	207	2098	4297	184
13	1986	1773	2390	793	828	1409	2120	1274	945	135	1832	3453	154
14	1987	2014	1878	897	1094	1484	1991	1044	1021	169	1720	2753	136
15	1988	2249	2263	1025	1288	2092	2604	1288	1501	235	2064	3444	172
16	1989	2403	2688	1189	1383	2117	2516	1347	1251	225	2518	4057	193
17	1990	2589	2965	1310	1510	2263	2544	1382	1274	229	2739	4206	200
18	1991	2782	3254	1435	1643	2414	2567	1416	1294	234	2969	4354	208
19	1992	2973	3545	1562	1775	2562	2577	1444	1310	238	3199	4489	215
20	1993	3150	3823	1682	1901	2698	2567	1462	1315	240	3415	4594	221
21	1994	3331	4108	1806	2029	2835	2552	1479	1318	241	3635	4697	226
22	1995	3510	4393	1930	2157	2971	2529	1492	1318	243	3855	4791	231
23	1996	3698	4693	2059	2292	3113	2507	1506	1318	244	4086	4891	237
24	1997	3878	4985	2186	2422	3248	2473	1515	1313	244	4309	4975	242

ESTADISTICA PANAMENA, INFORMACION AGROPECUARIA, SUPERFICIE SEMBRADA Y PRODUCCION DE ARROZ, MAIZ Y FRIJOL, 1979-1988.
DIRECCION DE ESTADISTICA Y CENSO, PRELIMINARY DISTRICT ESTIMATES.

(Continued)

TABLE 3B. AREA PLANTED TO FIRST HARVEST RICE IN PANAMA
(UNIT = 10 HECTARES)

PER YEAR 1977-1988, WITH PROJECTIONS THROUGH 1997

PERIOD NO.	YEAR	DISTRICT IN CHIRIQUI PROVINCE 13TH	14TH	15TH	16TH	17TH	PROVINCE TOTAL
4	1977	135	136	62	78	126	1622
5	1978	170	159	76	92	125	1810
6	1979	135	182	61	63	108	1710
7	1980	159	171	79	99	159	2210
8	1981	200	177	90	109	188	2320
9	1982	160	141	75	90	179	2260
10	1983	124	93	49	61	132	2480
11	1984	94	70	31	44	111	2221
12	1985	130	100	40	59	150	2610
13	1986	138	75	33	50	113	2258
14	1987	124	72	33	49	108	2128
15	1988	139	101	45	68	130	2658
16	1989	115	45	23	42	123	2711
17	1990	109	28	16	35	120	2809
18	1991	102	10	8	28	117	2908
19	1992	94	0	0	21	112	3009
20	1993	85	0	0	13	107	3109
21	1994	76	0	0	4	101	3213
22	1995	65	0	0	0	94	3310
23	1996	55	0	0	0	87	3420
24	1997	43	0	0	0	80	3518
	Ybar	.06661	.05888	.02660	.03379	.06276	
	b(X)	-.00370	-.00651	-.00281	-.00283	-.00267	
	rsq	.63583	.77885	.80278	.73171	.59216	
	Syz	.01059	.01311	.00527	.00648	.00838	
	sb	.00089	.00110	.00044	.00054	.00070	

ESTADISTICA PANAMENA, INFORMACION AGROPECUARIA, SUPERFICIE SEMBRADA Y PRODUCCION DE ARROZ, MAIZ Y FRIJOL, 1979-1988.
DIRECCION DE ESTADISTICA Y CENSO, PRELIMINARY DISTRICT ESTIMATES.

(Continue

TABLE 3C. AREA PLANTED TO FIRST HARVEST RICE IN PANAMA
(HECTARES)

PER YEAR 1977-1988, WITH PROJECTIONS THROUGH 1997

PERIOD NO.	YEAR	DISTRICT IN CHIRIQUI PROVINCE 13TH	14TH	15TH	16TH	17TH	PROVINCE TOTAL
4	1977	1354	1362	617	776	1260	16199
5	1978	1701	1587	758	925	1253	18099
6	1979	1354	1825	605	632	1076	17101
7	1980	1594	1705	788	987	1594	22098
8	1981	1996	1772	901	1094	1880	23199
9	1982	1600	1411	746	902	1788	22600
10	1983	1244	927	491	610	1323	24800
11	1984	939	698	306	437	1115	22203
12	1985	1296	996	401	595	1497	26099
13	1986	1380	752	335	505	1133	22601
14	1987	1241	722	333	491	1083	21300
15	1988	1388	1010	448	676	1302	26599
16	1989	1153	450	226	418	1230	27101
17	1990	1092	284	155	354	1200	28102
18	1991	1023	104	79	284	1165	29100
19	1992	944	0	0	208	1122	30101
20	1993	853	0	0	126	1066	31102
21	1994	756	0	0	40	1007	32100
22	1995	653	0	0	0	941	33101
23	1996	545	0	0	0	874	34109
24	1997	432	0	0	0	800	35200

ESTADISTICA PANAMENA, INFORMACION AGROPECUARIA, SUPERFICIE SEMBRADA Y PRODUCCION DE ARROZ, MAIZ Y FRIJOL, 1979-1988.
DIRECCION DE ESTADISTICA Y CENSO, PRELIMINARY DISTRICT ESTIMATES.

Listing of Output File of Proration Data

4	1977	84	61	27	41	78	193	98	98	12	63	222	108
5	1978	105	61	28	41	92	224	99	99	12	67	246	114
6	1979	105	57	26	39	87	210	93	95	17	70	253	109
7	1980	113	87	35	52	131	235	117	119	26	131	350	147
8	1981	111	82	36	52	132	233	116	116	29	122	367	160
9	1982	129	96	51	63	137	235	112	114	25	137	331	185
10	1983	155	136	72	87	173	283	132	132	25	175	414	237
11	1984	169	150	76	93	159	252	128	117	18	178	383	148
12	1985	182	195	90	113	182	277	134	113	21	210	430	184
13	1986	177	239	79	83	141	212	127	95	14	183	345	154
14	1987	201	188	90	109	148	199	104	102	17	172	275	137
15	1988	225	226	102	129	209	260	129	150	23	206	344	172
16	1989	240	269	119	138	212	252	135	125	22	252	406	193
17	1990	259	296	131	151	226	254	138	127	23	274	421	201
18	1991	278	325	144	164	241	257	142	129	23	297	435	208
19	1992	297	354	156	178	256	258	144	131	24	320	449	215
20	1993	315	382	168	190	270	257	146	131	24	341	459	221
21	1994	333	411	181	203	284	255	148	132	24	364	470	227
22	1995	351	439	193	216	297	253	149	132	24	386	479	232
23	1996	370	469	206	229	311	251	151	132	24	409	489	237
24	1997	388	498	219	242	325	247	151	131	24	431	497	242
4	1977	135	136	62	78	126							
5	1978	170	159	76	92	125							
6	1979	135	182	61	63	108							
7	1980	159	171	79	99	159							
8	1981	200	177	30	109	188							
9	1982	160	141	75	90	179							
10	1983	124	93	49	61	132							
11	1984	94	70	31	44	111							
12	1985	130	100	40	59	150							
13	1986	138	75	33	50	113							
14	1987	124	72	33	49	108							
15	1988	139	101	45	68	130							
16	1989	115	45	23	42	123							
17	1990	109	28	16	35	120							
18	1991	102	10	8	28	117							
19	1992	94	0	0	21	112							
20	1993	85	0	0	13	107							
21	1994	76	0	0	4	101							
22	1995	65	0	0	0	94							
23	1996	55	0	0	0	87							
24	1997	43	0	0	0	80							

SECTION VIII

PROJECTED INVENTORY OF FARM TRACTORS IN EGYPT (PPJCASE.TWO)

This PPJCase.Two of projected inventories of farm tractors in a governorate of Egypt, although partly hypothetical, serves to illustrate the power of the Proration Projection Program for developing component projections with limited direct information as basis for the prorations. Inventories for farm tractors as a group are reported annually by province, but no breakdown is given by type, size or age of the machines. The data by type, size and age of farm tractors is reported only each five years, and that by region of several provinces rather than by province. Estimates are made annually of purchases of tractors by farmers, and off-farm sales of tractors (including those traded in on the new tractor purchases). The problem is to develop reliable estimates of projected farm tractor inventories in each province by type (two-wheel, four-wheel, crawler), by horse power (HP) rating, and by age category. This information serves as basis for planning such activities as tractor fuel distribution, service and repair activities, tractor-drawn farm implement sales and distribution, and new tractor sales programs in the provinces involved. The PRORATPJ Program is well-suited for addressing this kind of problem.

As discussed in Section II (pages 5-8), formal techniques are used in the PRORATPJ Program to force the sum of the components to equal the master total, both for the historical period and for the projected period. The program first converts the historical prorate input data into percentages of the corresponding total to which they should add. It next fits a statistical time trend to these relative percentages as they have existed through time, and then projects the relative percentages into the future, making an internal work table of these percentages.

At the projection step the program imposes the rule of no negative component percentages, setting any such values equal to zero, and distributing the difference proportionally among the other components so that the percentage values always sum to 100.00 percent for each historical and projected period. Finally, to develop the proration projections which sum exactly to the specified column in the master table, the program need only apply the period by period percentages in the internal work table to the figures in that column of the master table to obtain the values for the printed prorate tables. In order to retain significant digits in the proration process, the program automatically multiplies the figures in the master table column by 10 before applying the proration percentages for the prorate output table. For this reason, the units in the prorate table represent those of the corresponding master table adjusted by a factor of 10.

Basis for Estimation of Proration Data

The PPJCase Two problem is illustrative of cases in which the kinds of data needed as basis for proration are incomplete and/or unreliable. In this instance, they are available only in years of special census every five years. In this case, it is possible to estimate the values for proration as functions of one or more related variables which are reported in available statistical publications. This option is implemented by setting IREG[regression] at Step

1 - 1 and providing the intercept and regression coefficients at Step 4. In those census years when observed values for the Y variable are available, such values are indicated as override data at Step 5 of PRORATPJ. As pointed out in Section II, these options of the proration program are entered through the separate keyboard read program, PRORATF1.

In this PPJCase Two the data to be used for prorating the reported inventories of farm tractors by province into components by type, size and age category are the reported values by region of several provinces. These data are reported every five years when the agricultural census is taken, but the series starts in 1980, or five years later than the master projections. For the intervening historical years, the proration data are estimated from the function, Y(ijkl) = I(i-1,jkl) + P(ijkl) - S(ijkl), where

Y represents the inventory in year i of tractors j of size k and age l,
I represents the inventory in year i-1 of tractors j of size k and age l,
P represents the purchases in year i of tractors j of size k and age l,
S represents the sales in year i of tractors j of size k and age l.

The data needed for proration projections are estimated from this equation for each of the historical years, but the reported data are substituted for the estimates in those years when available from the agricultural census. It is assumed that the shifts in patterns of type, size and age combinations in the region are applicable to each province in the region. Both the Y estimates and the override data apply to the total district of which the governorate of interest is a part. Because the proration data are converted to percentages of the master data by the program, the district data are transformed automatically to governorate data.

Once the proration data are estimated, the prorations to the master projections are made in the same manner as would be the case if proration data were reported directly for the entire historical period. The procedure insures that the sum of the components will equal to the master projections for each historical and projected period in the time series.

Description of the Case

The PPJCASE.TWO involves prorate projections of farm tractor inventories by type, size and age category within Kafr el Sheikh Governorate through year 2000. The case is based on master projections of total farm tractors in inventory by governorate with the Master Projection Program as described in the companion manual, Regression Projection Programs with Multiple Options for Use on MS-DOS Microcomputers, A. Master Projections.

The MASTERPJ problem is structured with linear projections of total farm tractor inventories by governorate in Egypt for 1989 through 2000 based upon historical trends from 1975 through 1988. An OUTPUT.MPJ file is developed in that run for use with the PRORATPJ program to project prorations of tractor inventories by type, size and age category.

The PRORATPJ problem is structured for 32 distinct categories in one governorate (Kafr el Sheikh) based on previous inventories, tractor purchases and tractor

sales for 1980 through 1988, or the last nine of the 14 years included in the corresponding master table. Prorate projections are printed as three tables, one for two-wheel tractors, one for four-wheel tractors, and one for crawler tractors. Subtotals are made across the size and age categories for each type of tractor, and a grand total is made on the last table for all three types of tractors combined. Prorate conversion tables are made to convert the primary prorations from units of tractors X 10 to units of numbers of tractors in inventory.

Options of PRORATPJ which are exercised in the projections reported here include the following:

1. Prorate to Kafr el Sheikh Governorate in the master table (ISTATE at Input.PPJ Step 1 = 6), starting with 1980 (ICYEAR at Input.PPJ Step 1 = 6).

2. Estimate the prorate data as Y = f(X1,X2,X3), i.e., NOLOOP at Step 2 = 3.

3. Make conversion tables of the prorate projections (IFEED at Input.PPJ Step 2 = 1 and CONST at Step 6 = 0.10).

4. Create a computer file of the conversion prorate table output (ICARDS at Input.PPJ Step 2 = 1).

5. Make subtotals by type of tractor (IDIST1 at Input.PPJ Step 3 = 1, IDIST2 = 2, and IDIST3 = 3).

6. Use estimation equation Y = 0.0 + 1.0X1 + 1.0X2 - 1.0X3 (at Step 4 ATRCEP = 0.0, BCOEF1 = 1.0, BCOEF2 = 1.0, BCOEF3 = -1.0).

7. Use reported Census data to override the Y estimates for 1980 and 1985 (at Step 5 NOEXCP = 2, IEXCEP1 = 6, IEXCEP2 = 11).

8. Put 8 categories and a subtotal on the first page of prorate output (PRORATPJ Step 11 command for the first set of prorate input data = 8 8).

9. Put 8 categories and no subtotal on the second page of prorate output (PRORATPJ Step 11 command for the second set of prorate input data = 8 16).

10. Put 8 categories and the subtotal for all four-wheel tractors on the third page of prorate output (PRORATPJ Step 11 command for the first set of prorate input data = 8 16).

11. Put 8 categories and the crawler tractor total on the fourth page of prorate output (PRORATPJ Step 11 command for the fourth set = 8 8).

The data and results for the case are presented on the following pages in the standard order followed throughout the manual, namely:

1. Image of the MASTERPJ computer file output, OUTPUT.MPJ, created in the MASTERPJ run.

2. Reproduction of the file of PRORATPJ input commands and titles for the run, INPUT.PPJ.

3. Reproduction of the proration data input file for the run, PPJDATA.RUN.

4. The primary output prorate table for the first page of prorate output, Table 2-X, for two-wheel tractors in units of tractors X 10.

5. The output conversion table for the first page of prorate output, Table 2-6, for two-wheel tractors in units of number of tractors.

6. The primary output prorate table for the second page of prorate output, Table 2-X, for four-wheel tractors up to 50 HP in units of tractors X 10.

7. The output conversion table for the second page of prorate output, Table 2-6, for four-wheel tractors up to 50 HP in units of tractors.

8. The primary output prorate table for the third page of prorate output, Table 2-X, for four-wheel tractors over 50 HP in units of tractors X 10.

9. The output conversion table for the third page of prorate output, Table 2-6, for four-wheel tractors over 50 HP in units of number of tractors.

10. The primary output prorate table for the fourth page of prorate output, Table 2-X, for crawler tractors in units of tractors X 10.

11. The output conversion table for the fourth page of prorate output, Table 2-6, for crawler tractors in units of number of tractors.

12. Reproduction of the computer file, OUTPUT.PPJ, showing the output data for the conversion proration table, which was requested in the run.

MASTERPJ Program Output for the Case (Output.MPJ)

The computer file of the output from the MASTERPJ run described in the companion Master Projection Manual, OUTPUT.MPJ, serves as basis for the proration projections. As indicated by the reproduction of the file shown below, the master projections of farm tractor inventories in Egypt include all governorates; any of the governorate totals could be prorated into components as has been done for Kafr el Sheikh Governorate in this PPJCase.Two.

It also will be noted that the OUTPUT.MPJ file includes command codes and information as well as the accompanying title, headers and footnotes for the master projections from which prorations are to be made. All of this information together with the master projections is written to computer file by MASTERPJ in response to the JCOUTY command, and is read by PRORATPJ as a first step toward setting up and projecting the prorations which have been requested.

```
40  40   2   1   0   1   1
14  14   0   0  12  11   2   1   1   0   0   0   0   0   0   0   0   1   0
 2   8   3
 1  11
```

```
ERNORATE IN                    TABLE 2.  NUMBER OF FARM TRACTORS IN INVENTORY BY GOV

UGH 2000                            LOWER EGYPT, 1975 TO 1988, WITH PROJECTIONS THRO
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GOVERNORATE

PERIOD NO.	YEAR	ALEXANDRIA	SUEZ	ISMAILIYA	REGIONAL BEHEIRA	DAMIETTA	KAFR EL SHEIKH	GHARBIYA	DAQAHLIYA	SHARQIYA	MENOUFIA	QALYUBIA	TOTAL

Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic. Cairo, 1989.
Units are reported numbers of farm tractors on hand, regardless of type, size or age.

1	1975	1880.	2500.	3000.	3540.	2530.	1800.	2570.	1440.	1000.	4980.	1680.
2	1976	1750.	2880.	3170.	2880.	2330.	1700.	2240.	1720.	2750.	2630.	2670.
3	1977	840.	2490.	2640.	2800.	2440.	1840.	1860.	1450.	2980.	2650.	2740.
4	1978	1700.	2780.	2280.	2460.	2630.	1620.	2280.	1780.	2650.	2380.	2440.
5	1979	1020.	2920.	2080.	2920.	2450.	2000.	2440.	1930.	3900.	2390.	2480.
6	1980	990.	3100.	2010.	2830.	2290.	1830.	2200.	1820.	3300.	2430.	2450.
7	1981	1630.	2700.	2270.	2750.	2580.	1610.	1800.	2070.	3250.	2370.	2380.
8	1982	1550.	3270.	2510.	2840.	1780.	2140.	2040.	1940.	3030.	2330.	2340.
9	1983	1500.	2830.	2210.	2440.	2110.	1920.	2400.	1580.	3100.	2510.	2560.
10	1984	1500.	3710.	2360.	2620.	2180.	2070.	1950.	1680.	3140.	2350.	2380.
11	1985	1350.	3960.	2600.	3030.	2200.	2640.	1750.	1750.	3130.	2570.	2570.
12	1986	1360.	4360.	2400.	2580.	2370.	2770.	1700.	1530.	3200.	2800.	2700.
13	1987	600.	4290.	1890.	1970.	2020.	3500.	1880.	1460.	3200.	2900.	2940.
14	1988	600.	4620.	2030.	2330.	2050.	3700.	1790.	1580.	2020.	2920.	2870.
15	1989	922.	4500.	1988.	2280.	2019.	3232.	1720.	1652.	3216.	2381.	2841.
16	1990	871.	4658.	1934.	2222.	1984.	3367.	1675.	1646.	3257.	2335.	2884.
17	1991	820.	4816.	1880.	2164.	1949.	3501.	1629.	1640.	3299.	2288.	2927.
18	1992	769.	4974.	1827.	2106.	1914.	3636.	1583.	1634.	3340.	2242.	2970.
19	1993	718.	5131.	1773.	2049.	1879.	3770.	1537.	1629.	3382.	2195.	3013.
20	1994	667.	5289.	1720.	1991.	1844.	3905.	1491.	1623.	3424.	2149.	3056.
21	1995	616.	5447.	1666.	1933.	1809.	4039.	1445.	1617.	3465.	2102.	3099.
22	1996	565.	5605.	1613.	1875.	1774.	4173.	1400.	1611.	3507.	2056.	3141.
23	1997	514.	5763.	1559.	1817.	1738.	4308.	1354.	1605.	3548.	2009.	3184.
24	1998	463.	5921.	1506.	1759.	1703.	4442.	1308.	1600.	3590.	1963.	3227.
25	1999	412.	6079.	1452.	1702.	1668.	4577.	1262.	1594.	3632.	1917.	3270.
26	2000	361.	6237.	1398.	1644.	1633.	4711.	1216.	1588.	3673.	1870.	3313.

Commands and Headings for the Case (Input.PPJ)

The INPUT.PPJ file of commands, information and titles for the case as created by PRORATE1 is reproduced below. As described in Section V, the file is created from keyboard commands in response to program prompts displayed on the monitor screen. As the starting point, a set of default values is read from the DEFAULT.PRO file in the same order and format as the INPUT.PPJ file.

The first three lines of integer commands in the accompanying file are common to the INPUT.PPJ file for all proration problems. The number and content of the remaining lines of integer and real number commands are functions of the

responses indicated on the first three. In this prorate example, the entries include values for the Y intercept and b coefficients for X1 through X3, the number and specific periods of override data, and the codes and conversion factors for the conversion prorate table before coming to the listing of the titles and footnotes for the proration tables in the command file. The listing includes ten title lines for the primary proration table plus four title lines for the conversion table followed by the four lines of footnotes for the output tables.

```
   6   0   0   9   0   6   0   1   0  32   0
   3   0   1   0   0   1
   3   1   2   3   0   0   0   0   0   0
0.0000 1.0000 1.0000 -1.000 .00000 .00000 .00000 .00000 .00000 .00000
   2   6  11
                6  0.10000
                0    .0000
                     TABLE 2-X. WORK TABLE FOR FARM TRACTORS IN KAFR EL SHEIKH (
UNIT = TRACTORS X 10)
                                                BY TYPE, SIZE AND AGE GROUP

                                          PER YEAR 1980-1988, WITH PROJECTIONS THROU
GH 2000


                                                Type, Size and Age Category

                          TABLE 2-6. ESTIMATED NUMBER OF FARM TRACTORS IN INVENTORY
 IN KAFR EL SHEIKH
                                                BY TYPE, SIZE AND AGE GROUP

Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by
Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-far
m sales; override data for 1980 and 1985.
```

Proration Input Data for the Case (PPJdata.Run)

The accompanying listing of the PPRDATA.RUN file for the Egyptian tractor inventory case was developed by the user with EDLIN or with LOTUS in the manner described in Section IV. Being a relatively complex example with four sets of proration input data for three independent variables, this second PPJCase illustrates the pattern of the proration input file for proration projections with PRORATPJ which involve Y estimates from a regression equation together with superseding override data in specified census years.

In this example, the integer line of the first data set indicates 8 components (i.e., categories) in the set and 8 components in the subtotal. The header lines identify these 8 components for which the proration data follow immediately below. The nine periods of data for X1 come first, followed by those for X2 and then those for X3. In the two periods for which override data are available (Periods 1 and 6), these numbers are substituted for the X1 data in the input file.

The integer line of the second data set for the proration indicates 8 components in the set and 16 components in the subtotal. The eight are identified by the accompanying header lines which precede the proration data for this set. The data for this set and those for the third and fourth sets follow the same order and pattern as the first set.

Period	8	8						
	Two-Wheel, 5 HP or Less				Two-Wheel, Over 5 HP			
No. Year	Total > 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	
0-2 Yrs	Two-Wheel							
1	150	130	120	85	166	158	118	95
2	150	130	120	85	166	158	118	95
3	152	132	122	87	167	159	119	96
4	154	134	124	89	168	160	120	97
5	157	137	127	92	169	161	121	98
6	158	142	131	90	170	162	130	119
7	161	141	131	96	171	163	123	100
8	164	144	134	99	172	164	124	101
9	167	147	137	102	173	165	125	102
1	7	7	7	7	8	8	8	8
2	7	7	7	7	8	8	8	8
3	7	7	7	7	9	9	9	9
4	8	8	8	8	9	9	9	9
5	8	8	8	8	10	10	10	10
6	8	8	8	8	10	10	10	10
7	9	9	9	9	11	11	11	11
8	9	9	9	9	11	11	11	11
9	9	9	9	9	12	12	12	12
1	5	5	5	5	7	7	7	7
2	5	5	5	5	7	7	7	7
3	5	5	5	5	8	8	8	8
4	5	5	5	5	8	8	8	8
5	6	6	6	6	9	9	9	9
6	6	6	6	6	9	9	9	9
7	6	6	6	6	10	10	10	10
8	6	6	6	6	10	10	10	10
9	6	6	6	6	11	11	11	11

Period	8	16						
P	Four-Wheel, 25 HP or Less				Four-Wheel, 26 to 50 H			
No. Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	
0-2 Yrs								
1	245	170	160	152	356	321	310	296
2	245	170	160	152	356	321	310	296
3	246	171	161	153	360	325	314	300
4	247	172	162	154	364	329	318	304
5	248	173	163	155	369	334	323	309
6	251	179	168	159	383	346	334	319
7	251	176	166	158	379	344	333	319
8	252	177	167	159	384	349	338	324
9	253	178	168	160	389	354	343	329
1	13	13	13	13	25	25	25	25
2	13	13	13	13	25	25	25	25
3	13	13	13	13	25	25	25	25
4	13	13	13	13	26	26	26	26
5	13	13	13	13	26	26	26	26
6	14	14	14	14	26	26	26	26
7	14	14	14	14	27	27	27	27
8	14	14	14	14	27	27	27	27
9	14	14	14	14	27	27	27	27
1	11	11	11	11	21	21	21	21
2	12	12	12	12	21	21	21	21
3	12	12	12	12	21	21	21	21
4	12	12	12	12	21	21	21	21
5	12	12	12	12	21	21	21	21
6	12	12	12	12	22	22	22	22
7	13	13	13	13	22	22	22	22
8	13	13	13	13	22	22	22	22
9	13	13	13	13	22	22	22	22

Period	8	16						
P	Four-Wheel, 51 to 100 HP				Four-Wheel, Over 100 H			
No. Year	Total > 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	
0-2 Yrs	Four-Wheel							
1	632	591	467	334	258	244	236	202
2	632	591	467	334	258	244	236	202
3	641	600	476	343	262	248	240	206
4	650	609	485	352	267	253	245	211
5	659	618	494	361	271	257	249	215
6	676	630	500	371	281	272	264	223
7	679	638	514	381	280	266	258	224
8	689	648	524	391	285	271	263	229

9	699	658	534	401	290	276	268	234
1	28	28	28	28	17	17	17	17
2	29	29	29	29	17	17	17	17
3	30	30	30	30	18	18	18	18
4	30	30	30	30	18	18	18	18
5	31	31	31	31	18	18	18	18
6	31	31	31	31	19	19	19	19
7	32	32	32	32	19	19	19	19
8	32	32	32	32	20	20	20	20
9	33	33	33	33	20	20	20	20
1	20	20	20	20	13	13	13	13
2	20	20	20	20	13	13	13	13
3	21	21	21	21	13	13	13	13
4	21	21	21	21	14	14	1	14
5	21	21	21	21	14	14	14	14
6	21	21	21	21	14	14	14	14
7	22	22	22	22	15	15	15	15
8	22	22	22	22	15	15	15	15
9	22	22	22	22	15	15	15	15
	8	6						
Period	Crawlers, Up to 100 HP				Crawlers, Over 100 HP			
No. Year	Total > 10 Yrs	Total 6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	
0-2 Yrs	Crawlers	Tractors						
1	24	18	10	7	22	20	9	7
2	24	18	10	7	22	20	9	7
3	25	19	11	8	23	21	10	8
4	25	19	11	8	23	21	10	8
5	25	19	11	8	23	21	10	8
6	25	19	11	7	24	20	10	7
7	26	20	12	9	24	22	11	9
8	26	20	12	9	24	22	11	9
9	26	20	12	9	24	22	11	9
1	0	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1

Primary Table and Conversion Table Prorations

The eight accompanying proration tables represent the four-page primary proration output plus the corresponding conversion prorations (in this case the primary prorations multiplied by a factor of 0.1 to convert to units of numbers of tractors). The values for all 32 categories are prorated to one column of historical and projected inventories in the master table, that for Kafr el Sheikh Governorate.

The primary proration tables include the statistical parameters for each of the columns included in the prorations to the master table. These parameters (Y-bar, b, r-squared, Syz and sb) are based on the trend of that column as a percentage of the column in the master table (in this case Kafr el Sheikh Governorate). For example, the parameters for the first column in Table 2-X are .0245, .00001, .0098, .00021, and .00003, respectively. That is, this category

on average represented 2.45 per cent of the Governorate total, and this percentage is increasing by 0.001 per cent per year. The trend regression explains about one per cent (square root of .0098) of the year-to-year variation around the 2.45 per cent mean. The Syz is .00021 compared to the standard error of estimate (sb) of .00003, indicating statistically significant fit of the regression equation for this category.

The totals by tractor type appear on the first, third and fourth pages of the primary (and conversion) proration tables. These subtotals are obtained by horizontal summation across the respective size and age components. The grand total of all tractors appears on the fourth page of the output; it serves as a check against the column in the master table to which the data are prorated. For example, note that the totals on page 67 represent the values for Kafr el Sheikh Governorate in the master table (sixth column, page 55); e.g., in 1980 the value is 1830, in 1991 the value is 3501, and in 1998 the value is 4442. The slight difference between the value in the master table and the total on page 67 in some years is due to rounding.

Primary Prorations for Two-Wheel Tractors

TABLE 2-X. WORK TABLE FOR FARM TRACTORS IN KAFR EL SHIEKH (UNIT = TRACTORS X 10)
BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category								
		Two-Wheel, 5 HP or Less				Two-Wheel, Over 5 HP				Total
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	Two-Wheel
6	1980	449	389	359	254	497	473	353	284	3058
7	1981	394	342	317	226	433	413	309	249	2683
8	1982	524	456	422	303	571	544	408	330	3558
9	1983	472	412	382	277	508	484	364	295	3194
10	1984	508	444	412	300	543	518	390	316	3431
11	1985	634	570	526	361	682	650	522	477	4422
12	1986	679	596	555	410	712	679	513	418	4562
13	1987	861	758	707	526	892	851	645	526	5766
14	1988	913	806	752	564	935	892	677	553	6092
15	1989	793	704	657	490	808	771	594	499	5316
16	1990	826	736	688	516	833	796	615	519	5529
17	1991	859	767	718	541	858	820	636	539	5738
18	1992	893	799	749	568	883	843	656	559	5950
19	1993	926	831	779	594	906	866	676	579	6157
20	1994	959	863	811	621	929	888	696	598	6365
21	1995	992	896	842	649	951	910	716	618	6574
22	1996	1026	928	873	676	973	930	735	637	6778
23	1997	1059	961	905	705	994	951	754	657	6986
24	1998	1092	993	937	733	1014	971	773	676	7189
25	1999	1126	1026	969	762	1034	990	791	695	7393
26	2000	1159	1059	1001	792	1053	1009	809	714	7596
	Ybar	.02450	.02148	.01992	.01442	.02620	.02496	.01893	.01558	
	b(%)	.00001	.00006	.00008	.00015	-.00024	-.00022	-.00011	-.00003	
	rsq	.00980	.93653	.94484	.59298	.99423	.99317	.41700	.00555	
	Syz	.00021	.00005	.00006	.00036	.00005	.00005	.00038	.00102	
	sb	.00003	.00001	.00001	.00005	.00001	.00001	.00005	.00013	

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; over-ide data for 1980 and 1985.

Conversion Prorations for Two-Wheel Tractors

TABLE 2-6. ESTIMATED NUMBER OF FARM TRACTORS IN INVENTORY IN KAFR EL SHIEKH BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category								
		Two-Wheel, 5 HP or Less				Two-Wheel, Over 5 HP				Total
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	Two-Wheel
6	1980	45	39	36	25	50	47	35	28	305
7	1981	39	34	32	23	43	41	31	25	268
8	1982	52	46	42	30	57	54	41	33	355
9	1983	47	41	38	28	51	48	36	29	318
10	1984	51	44	41	30	54	52	39	32	343
11	1985	63	57	53	36	68	65	52	48	442
12	1986	68	60	55	41	71	68	51	42	456
13	1987	86	76	71	53	89	85	64	53	577
14	1988	91	81	75	56	93	89	68	55	608
15	1989	79	70	66	49	81	77	59	50	531
16	1990	83	74	69	52	83	80	62	52	555
17	1991	86	77	72	54	86	82	64	54	575
18	1992	89	80	75	57	88	84	66	56	595
19	1993	93	83	78	59	91	87	68	58	617
20	1994	96	86	81	62	93	89	70	60	637
21	1995	99	90	84	65	95	91	72	62	658
22	1996	103	93	87	68	97	93	73	64	678
23	1997	106	96	90	70	99	95	75	66	697
24	1998	109	99	94	73	101	97	77	68	718
25	1999	113	103	97	76	103	99	79	70	740
26	2000	116	106	100	79	105	101	81	71	759

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; override data for 1980 and 1985.

(Contin

TABLE 2-X. WORK TABLE FOR FARM TRACTORS IN KAFR EL SHIEKH (UNIT = TRACTORS X 10)
BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category							
		Four-Wheel, 25 HP or Less				Four-Wheel, 26 to 50 HP			
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs
6	1980	733	509	479	455	1066	961	928	886
7	1981	638	444	418	397	934	843	815	778
8	1982	840	585	551	524	1238	1119	1081	1034
9	1983	746	520	490	466	1110	1004	971	929
10	1984	796	556	524	499	1195	1083	1048	1004
11	1985	1007	718	674	638	1536	1388	1340	1280
12	1986	1044	733	692	658	1590	1445	1400	1342
13	1987	1305	918	867	825	2007	1826	1769	1697
14	1988	1364	961	908	865	2116	1928	1869	1794
15	1989	1179	836	789	751	1848	1685	1633	1568
16	1990	1215	864	816	777	1922	1754	1701	1634
17	1991	1250	891	841	801	1995	1823	1768	1700
18	1992	1284	917	867	826	2067	1892	1836	1766
19	1993	1316	943	891	849	2139	1960	1903	1831
20	1994	1348	968	915	873	2212	2029	1971	1898
21	1995	1378	993	939	896	2283	2097	2038	1963
22	1996	1407	1017	962	918	2354	2165	2105	2029
23	1997	1436	1040	985	940	2425	2234	2173	2096
24	1998	1463	1063	1007	961	2496	2302	2240	2162
25	1999	1489	1086	1028	982	2567	2370	2307	2228
26	2000	1514	1107	1049	1002	2637	2438	2374	2294
	Ybar	.03847	.02695	.02539	.02414	.05775	.05232	.05060	.04843
	b(%)	-.00040	-.00022	-.00019	-.00018	-.00011	-.00004	-.00001	.00002
	rsq	.99909	.91707	.94533	.97534	.66389	.39773	.18697	.50608
	Syz	.00003	.00019	.00014	.00008	.00023	.00013	.00008	.00005
	sb	.00000	.00002	.00002	.00001	.00003	.00002	.00001	.00001

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; override data for 1980 and 1985.

(Continued)

TABLE 2-6. ESTIMATED NUMBER OF FARM TRACTORS IN INVENTORY IN KAFR EL SHIEKH BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category							
		Four-Wheel, 25 HP or Less				Four-Wheel, 26 to 50 HP			
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs
6	1980	73	51	48	46	107	96	93	89
7	1981	64	44	42	40	93	84	81	78
8	1982	84	58	55	52	124	112	108	103
9	1983	75	52	49	47	111	100	97	93
10	1984	80	56	52	50	120	108	105	100
11	1985	101	72	67	64	154	139	134	128
12	1986	104	73	69	66	159	145	140	134
13	1987	131	92	87	83	201	183	177	170
14	1988	136	96	91	86	212	193	187	179
15	1989	118	84	79	75	185	169	163	157
16	1990	122	86	82	78	192	175	170	163
17	1991	125	89	84	80	199	182	177	170
18	1992	128	92	87	83	207	189	184	177
19	1993	132	94	89	85	214	196	190	183
20	1994	135	97	92	87	221	203	197	190
21	1995	138	99	94	90	228	210	204	196
22	1996	141	102	96	92	235	217	211	203
23	1997	144	104	98	94	243	223	217	210
24	1998	146	106	101	96	250	230	224	216
25	1999	149	109	103	98	257	237	231	223
26	2000	151	111	105	100	264	244	237	229

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; override data for 1980 and 1985.

(Continue

TABLE 2-X. WORK TABLE FOR FARM TRACTORS IN KAFR EL SHIEKH (UNIT = TRACTORS X 10)
BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category								
		Four-Wheel, 51 to 100 HP				Four-Wheel, Over 100 HP				Total
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	Four-Wheel
6	1980	1892	1769	1398	1000	772	730	706	605	14889
7	1981	1663	1557	1235	890	680	643	623	535	13093
8	1982	2210	2071	1649	1197	908	860	833	718	17418
9	1983	1982	1858	1485	1086	815	773	749	647	15631
10	1984	2138	2007	1611	1186	879	834	809	700	16869
11	1985	2712	2527	2006	1488	1127	1091	1059	895	21486
12	1986	2853	2683	2170	1619	1176	1118	1085	944	22552
13	1987	3606	3394	2755	2069	1496	1424	1382	1207	28547
14	1988	3813	3593	2927	2213	1584	1509	1466	1284	30194
15	1989	3325	3131	2553	1943	1385	1325	1288	1125	26364
16	1990	3462	3263	2670	2045	1445	1385	1347	1179	27479
17	1991	3598	3394	2787	2148	1506	1444	1405	1232	28583
18	1992	3735	3526	2905	2254	1566	1504	1464	1287	29696
19	1993	3870	3657	3023	2360	1627	1564	1523	1342	30798
20	1994	4007	3789	3143	2469	1688	1624	1583	1398	31915
21	1995	4142	3920	3263	2578	1749	1685	1643	1453	33020
22	1996	4277	4051	3384	2689	1810	1745	1703	1510	34126
23	1997	4414	4183	3506	2803	1871	1807	1764	1567	35244
24	1998	4548	4315	3629	2918	1933	1868	1825	1625	36355
25	1999	4684	4447	3753	3034	1995	1931	1887	1683	37471
26	2000	4819	4579	3877	3152	2057	1993	1948	1741	38581
Ybar		.10314	.09673	.07750	.05704	.04250	.04042	.03919	.03382	
b(%)		-.00005	.00003	.00030	.00062	.00007	.00012	.00014	.00020	
rsq		.49813	.03823	.58506	.92288	.82392	.51884	.59096	.97499	
Syz		.00016	.00042	.00074	.00052	.00010	.00033	.00033	.00009	
sb		.00002	.00005	.00010	.00007	.00001	.00004	.00004	.00001	

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; override data for 1980 and 1985.

(Continued)

TABLE 2-6. ESTIMATED NUMBER OF FARM TRACTORS IN INVENTORY IN KAFR EL SHIEKH BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category								
		Four-Wheel, 51 to 100 HP				Four-Wheel, Over 100 HP				Total
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	Four-Wheel
6	1980	183	177	140	100	77	73	71	60	1490
7	1981	166	156	124	89	68	64	62	53	1308
8	1982	221	207	165	120	91	86	83	72	1741
9	1983	198	186	149	109	81	77	75	65	1564
10	1984	214	201	161	119	88	83	81	70	1688
11	1985	271	253	201	143	113	109	106	89	2150
12	1986	285	268	217	162	118	112	108	94	2254
13	1987	361	339	275	207	150	142	138	121	2857
14	1988	381	359	293	221	158	151	147	128	3018
15	1989	332	313	255	194	139	133	129	112	2637
16	1990	346	326	267	205	145	138	135	118	2748
17	1991	360	339	279	215	151	144	141	123	2858
18	1992	373	353	291	225	157	150	146	129	2971
19	1993	387	366	302	236	163	156	152	134	3079
20	1994	401	379	314	247	169	162	158	140	3192
21	1995	414	392	326	258	175	168	164	145	3301
22	1996	428	405	338	269	181	175	170	151	3414
23	1997	441	418	351	280	187	181	176	157	3524
24	1998	455	431	363	292	193	187	183	162	3635
25	1999	468	445	375	303	199	193	189	168	3747
26	2000	482	458	388	315	206	199	195	174	3858

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; override data for 1980 and 1985.

(Contin

TABLE 2-X. WORK TABLE FOR FARM TRACTORS IN KAFR EL SHIEKH (UNIT = TRACTORS X 10)
BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category									
		Crawlers, Up to 100 HP				Crawlers, Over 100 HP				Total	Total
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	Crawlers	Tractors
6	1980	72	54	30	21	66	60	27	21	351	18298
7	1981	65	49	29	21	60	54	26	21	325	16101
8	1982	85	65	37	27	78	71	34	27	424	21400
9	1983	75	57	33	24	69	63	30	24	375	19200
10	1984	80	61	35	26	74	67	32	26	401	20701
11	1985	100	76	44	28	96	80	40	28	492	26400
12	1986	112	87	54	41	104	95	50	41	584	27698
13	1987	134	103	62	46	124	113	57	46	685	34998
14	1988	140	107	64	48	129	118	59	48	713	36999
15	1989	123	95	58	44	115	104	54	44	637	32317
16	1990	127	99	61	46	119	107	57	46	662	33670
17	1991	132	103	64	48	123	111	59	48	688	35009
18	1992	136	107	67	51	128	115	62	51	717	36363
19	1993	140	110	70	53	132	119	65	53	742	37697
20	1994	145	114	73	56	136	123	68	56	771	39051
21	1995	149	118	76	59	140	126	71	59	798	40392
22	1996	153	121	79	61	144	130	74	61	823	41727
23	1997	157	125	82	64	149	134	77	64	852	43082
24	1998	161	129	85	67	153	137	80	67	879	44423
25	1999	165	132	88	70	157	141	83	70	906	45770
26	2000	169	136	92	72	161	144	86	72	932	47109
Ybar		.00390	.00298	.00174	.00127	.00361	.00327	.00159	.00127		
b(X)		-.00002	-.00001	.00001	.00002	-.00001	-.00001	.00001	.00002		
rsq		.31966	.04022	.15496	.14937	.17846	.09612	.20429	.14937		
Syz		.00008	.00009	.00009	.00012	.00008	.00012	.00009	.00012		
sb		.00001	.00001	.00001	.00002	.00001	.00002	.00001	.00002		

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; override data for 1980 and 1985.

(Continued)

TABLE 2-6. ESTIMATED NUMBER OF FARM TRACTORS IN INVENTORY IN KAFR EL SHIEKH BY TYPE, SIZE AND AGE GROUP

PER YEAR 1980-1988, WITH PROJECTIONS THROUGH 2000

EXPONENT IS 1.00

Period		Type, Size and Age Category									
		Crawlers, Up to 100 HP				Crawlers, Over 100 HP				Total	Total
No.	Year	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	> 10 Yrs	6-10 Yrs	3-5 Yrs	0-2 Yrs	Crawlers	Tractors
6	1980	7	5	3	2	7	6	3	2	35	1830
7	1981	6	5	3	2	6	5	3	2	32	1608
8	1982	9	6	4	3	8	7	3	3	43	2139
9	1983	8	6	3	2	7	6	3	2	37	1919
10	1984	8	6	4	3	7	7	3	3	41	2072
11	1985	10	8	4	3	10	8	4	3	50	2642
12	1986	11	9	5	4	10	10	5	4	58	2768
13	1987	13	10	6	5	12	11	6	5	68	3502
14	1988	14	11	6	5	13	12	6	5	72	3698
15	1989	12	10	6	4	11	10	5	4	62	3230
16	1990	13	10	6	5	12	11	6	5	68	3371
17	1991	13	10	6	5	12	11	6	5	68	3501
18	1992	14	11	7	5	13	12	6	5	73	3639
19	1993	14	11	7	5	13	12	6	5	73	3769
20	1994	14	11	7	6	14	12	7	6	77	3906
21	1995	15	12	8	6	14	13	7	6	81	4040
22	1996	15	12	8	6	14	13	7	6	81	4173
23	1997	16	13	8	6	15	13	8	6	85	4306
24	1998	16	13	9	7	15	14	8	7	89	4442
25	1999	17	13	9	7	16	14	8	7	91	4578
26	2000	17	14	9	7	16	14	9	7	93	4710

SOURCE:
Ministry of Agriculture, Republic of Egypt, Statistical Series on Farm Inputs by Governorate for the Republic, Cairo, 1989.
Proration estimates based on prior inventory, new tractor purchases, and off-farm sales; override data for 1980 and 1985.

Listing of Output File of Proration Data

6	1980	45	39	36	25	50	47	35	28
7	1981	39	34	32	23	43	41	31	25
8	1982	52	46	42	30	57	54	41	33
9	1983	47	41	38	28	51	48	36	29
10	1984	51	44	41	30	54	52	39	32
11	1985	63	57	53	36	68	65	52	48
12	1986	68	60	55	41	71	68	51	42
13	1987	86	76	71	53	89	85	64	53
14	1988	91	81	75	56	93	89	68	55
15	1989	79	70	66	49	81	77	59	50
16	1990	83	74	69	52	83	80	62	52
17	1991	86	77	72	54	86	82	64	54
18	1992	89	80	75	57	88	84	66	56
19	1993	93	83	78	59	91	87	68	58
20	1994	96	86	81	62	93	89	70	60
21	1995	99	90	84	65	95	91	72	62
22	1996	103	93	87	68	97	93	73	64
23	1997	106	96	90	70	99	95	75	66
24	1998	109	99	94	73	101	97	77	68
25	1999	113	103	97	76	103	99	79	70
26	2000	116	106	100	79	105	101	81	71
6	1980	7[illegible]	51	48	46	107	96	93	89
7	1981	64	44	42	40	93	84	81	78
8	1982	84	58	55	52	124	112	108	103
9	1983	75	52	49	47	111	100	97	93
10	1984	80	56	52	50	120	108	105	100
11	1985	101	72	67	64	154	139	134	128
12	1986	104	73	69	66	159	145	140	134
13	1987	131	92	87	83	201	183	177	170
14	1988	136	96	91	86	212	193	187	179
15	1989	118	84	79	75	185	169	163	157
16	1990	122	86	82	78	192	175	170	163
17	1991	125	89	84	80	199	182	177	170
18	1992	128	92	87	83	207	189	184	177
19	1993	132	94	89	85	214	196	190	183
20	1994	135	97	92	87	221	203	197	190
21	1995	138	99	94	90	228	210	204	196
22	1996	141	102	96	92	235	217	211	203
23	1997	144	104	98	94	243	223	217	210
24	1998	146	106	101	96	250	230	224	216
25	1999	149	109	103	98	257	237	231	223
26	2000	151	111	105	100	264	244	237	229
6	1980	189	177	140	100	77	73	71	60
7	1981	166	156	124	89	68	64	62	53
8	1982	221	207	165	120	91	86	83	72
9	1983	198	186	149	109	81	77	75	65
10	1984	214	201	161	119	88	83	81	70
11	1985	271	253	201	149	113	109	106	89
12	1986	285	268	217	162	118	112	108	94
13	1987	361	339	275	207	150	142	138	121
14	1988	381	359	293	221	158	151	147	128
15	1989	332	313	255	194	139	133	129	112
16	1990	346	326	267	205	145	138	135	118
17	1991	360	339	279	215	151	144	141	123
18	1992	373	353	291	225	157	150	146	129
19	1993	387	366	302	236	163	156	152	134
20	1994	401	379	314	247	169	162	158	140
21	1995	414	392	326	258	175	168	164	145
22	1996	428	405	338	269	181	175	170	151
23	1997	441	418	351	280	187	181	176	157
24	1998	455	431	363	292	193	187	183	162
25	1999	468	445	375	303	199	193	189	168
26	2000	482	458	388	315	206	199	195	174
6	1980	7	5	3	2	7	6	3	2
7	1981	6	5	3	2	6	5	3	2
8	1982	9	6	4	3	8	7	3	3
9	1983	8	6	3	2	7	6	3	2
10	1984	8	6	4	3	7	7	3	3
11	1985	10	8	4	3	10	8	4	3
12	1986	11	9	5	4	10	10	5	4
13	1987	13	10	6	5	12	11	6	5
14	1988	14	11	6	5	13	12	6	5
15	1989	12	10	6	4	11	10	5	4
16	1990	13	10	6	5	12	11	6	5

Listing of Output File of Proration Data, continued

17	1991	13	10	6	5	12	11	6	5				
18	1992	14	11	7	5	13	12	6	5				
19	1993	14	11	7	5	13	12	6	5				
20	1994	14	11	7	6	14	12	7	6				
21	1995	15	12	8	6	14	13	7	6				
22	1996	15	12	8	6	14	13	7	6				
23	1997	16	13	8	6	15	13	8	6				
24	1998	16	13	9	7	15	14	8	7				
25	1999	17	13	9	7	16	14	8	7				
26	2000	17	14	9	7	16	14	9	7				
4	1977	84	61	27	41	78	193	98	98	12	63	222	108
5	1978	105	61	28	41	92	224	99	99	12	67	246	114
6	1979	105	57	26	39	87	210	93	95	17	70	253	109
7	1980	113	87	35	52	131	235	117	119	26	131	350	147
8	1981	111	82	36	52	132	233	116	116	29	122	367	160
9	1982	129	96	51	63	137	235	112	114	25	137	331	185
10	1983	155	136	72	87	173	283	132	132	25	175	414	237
11	1984	169	150	76	93	159	252	128	117	18	178	383	148
12	1985	182	195	90	113	182	277	134	113	21	210	430	184
13	1986	177	239	79	83	141	212	127	95	14	183	345	154
14	1987	201	188	90	109	148	199	104	102	17	172	275	137
15	1988	225	226	102	129	209	260	129	150	23	206	344	172
16	1989	240	269	119	138	212	252	135	125	22	252	406	193
17	1990	259	296	131	151	226	254	138	127	23	274	421	201
18	1991	278	325	144	164	241	257	142	129	23	297	435	208
19	1992	297	354	156	178	256	258	144	131	24	320	449	215
20	1993	315	382	168	190	270	257	146	131	24	341	459	221
21	1994	333	411	181	203	284	255	148	132	24	364	470	227
22	1995	351	439	193	216	297	253	149	132	24	386	479	232
23	1996	370	469	206	229	311	251	151	132	24	409	489	237
24	1997	388	498	219	242	325	247	151	131	24	431	497	242
4	1977	135	136	62	78	126							
5	1978	170	159	76	92	125							
6	1979	135	182	61	63	108							
7	1980	159	171	79	99	159							
8	1981	200	177	90	109	188							
9	1982	160	141	75	90	179							
10	1983	124	93	49	61	132							
11	1984	94	70	31	44	111							
12	1985	130	100	40	59	150							
13	1986	138	75	33	50	113							
14	1987	124	72	33	49	108							
15	1988	139	101	45	68	130							
16	1989	115	45	23	42	123							
17	1990	109	28	16	35	120							
18	1991	102	10	8	28	117							
19	1992	94	0	0	21	112							
20	1993	85	0	0	13	107							
21	1994	76	0	0	4	101							
22	1995	65	0	0	0	94							
23	1996	55	0	0	0	87							
24	1997	43	0	0	0	80							

SECTION IX

PROJECTED U.S. AGRICULTURAL EXPORTS (PPJCASE.USE)

This PPJCase.USe of projected exports of agricultural products by the United States by country of destination serves to illustrate the use of the Proration Projection Program for developing component projections rather than master projections which might be made from the same seven years of reported statistics. The case makes use of master projections by commodity group based on reported volumes for 29 years, 1960 through 1988. The prorations based on these projections tend to smooth out the rather sharp year-to-year fluctuations in exports to individual countries, and provide more reasonable estimates of projected volumes to each country than might be obtained by direct master projections.

As discussed in Section II (pages 5-8), formal techniques are used in the PRORATPJ Program to force the sum of the components to equal the master total, both for the historical period and for the projected period. The program first converts the historical prorate input data into percentages of the corresponding total to which they should add. It next fits a statistical time trend to these relative percentages as they have existed through time, and then projects the relative percentages into the future, making an internal work table of these percentages.

Description of the Case

The PPJCASE.USE involves prorate projections of U. S. exports of agricultural products by commodity group and destination country through year 1993. The case is based on master projections of total agricultural exports by commodity group with the Master Projection Program as described in the companion manual, Regression Projection Programs with Multiple Options for Use on MS-DOS Microcomputers, A. Master Projections.

The MASTERPJ problem is structured with linear projections of total exports by commodity class for 1989 through 1993 based upon historical trends from 1960 through 1988. An OUTPUT.MPJ file is developed in that run for use with the PRORATPJ program to project prorations of exports by destination country.

The PRORATPJ problem is structured for 52 distinct destination countries and areas of the world based on reported annual export tonnages to these countries for the 1982-1988 period, or the last seven the 29 years included in the corresponding master table. Prorate projections are printed as seven tables, one for East Asia, one for the Americas, one for Western Europe, one for Eastern Europe, one for the Middle East, one for the Asian Subcontinent, and one for other areas. Subtotals are made for each region, and a grand total is made on the last table for exports to all countries of the world. Prorate conversion tables are made to convert the primary prorations from units of 100 metric tons to units of 1,000 metric tons.

Options of PRORATPJ which are exercised in the projections reported here include the following:

1. Prorate to oilseed exports in the master table (ISTATE at Input.PPJ Step 1 = 4), starting with 1982 (ICYEAR at Input.PPJ Step 1 = 23), for the first set of prorations.

2. Prorate to feeds and fodders exports in the master table (ISTATE at Input.PPJ Step 1 = 6), starting with 1982 (ICYEAR at Input.PPJ Step 1 = 23), for the second set of prorations.

3. Make conversion tables of the prorate projections (IFEED at Input.PPJ Step 2 = 1 and CONST at Step 6 = 0.10).

4. Make subtotals by region (NDIST at Input.PPJ Step 3 = 7, and IDIST1 = 1, IDIST2 = 2, IDIST3 = 3, IDIST4 = 4, IDIST5 = 5, IDIST6 = 6, and IDIST7 = 7).

5. Put 11 countries and a subtotal on the first page of prorate output for each of the first three regions (PRORATPJ Step 11 command for the first three sets of prorate input data = 11 11).

6. Put 5 countries and a subtotal on the page of prorate output for Eastern Europe (PRORATPJ Step 11 command for the fourth set of prorate input data = 5 5).

7. Put 9 countries and a subtotal on the page of prorate output for the Middle East (PRORATPJ Step 11 command for the fifth set of prorate input data = 9 9).

8. Put 3 countries and a subtotal on the page of prorate output for the Subcontinent (PRORATPJ Step 11 command for the sixth set of prorate input data = 3 3).

9. Put 2 areas and a subtotal (as well as the world total) on the page of prorate output for other areas (PRORATPJ Step 11 command for the seventh set of prorate input data = 2 2).

The data and results for the case are presented on the following pages in the standard order followed throughout the manual, namely:

1. Image of the MASTERPJ computer file output, OUTPUT.MPJ, created in the MASTERPJ run.

2. Reproduction of the file of PRORATPJ input commands and titles for the run, INPUT.PPJ.

3. Reproduction of the proration data input file for the run, PPJDATA.RUN.

4. The primary output prorate table of oilseed exports for the first page of prorate output, Table 8, for the countries of East Asia in units of 100 metric tons.

5. The output conversion table for the first page of prorate output, Table 8A, for the East Asia countries in units of 1,000 metric tons.

6. The primary output prorate table of oilseed exports for the second page of prorate output, Table 8, for the countries of the Americas in units of 100 metric tons.

7. The output conversion table for the second page of prorate output, Table 8A, for the Americas in units of 1,000 metric tons.

8. The primary output prorate table of oilseed exports for the third page of prorate output, Table 8, for the countries of Western Europe in units of 100 metric tons.

9. The output conversion table for the third page of prorate output, Table 8A, for the Western European countries in units of 1,000 metric tons.

10. The primary output prorate table of oilseed exports for the fourth page of prorate output, Table 8, for Eastern European countries in units of 100 metric tons.

11. The output conversion table for the fourth page of prorate output, Table 8A, for Eastern European countries in units of 1,000 metric tons.

12. The primary output prorate table of oilseed exports for the fifth page of prorate output, Table 8, for countries of the Middle East in units of 100 metric tons.

13. The output conversion table for the fifth page of prorate output, Table 8A, for Middle Eastern countries in units of 1,000 metric tons.

14. The primary output prorate table of oilseed exports for the sixth page of prorate output, Table 8, for the Subcontinent countries in units of 100 metric tons.

15. The output conversion table for the sixth page of prorate output, Table 8A, for the Subcontinent countries in units of 1,000 metric tons.

16. The primary output prorate table of oilseed exports for the seventh page of prorate output, Table 8, for other areas in units of 100 metric tons.

17. The output conversion table for the seventh page of prorate output, Table 8A, for other areas in units of 1,000 metric tons.

18. Repeat of the output tables in Steps 4 through 17 for exports of feeds and fodders.

MASTERPJ Program Output for the Case (Output.MPJ)

The computer file of the output from the MASTERPJ run described in the companion Master Projection Manual, OUTPUT.MPJ, serves as basis for the proration projections. As indicated by the reproduction of the file shown below, the master projections of agricultural exports by U. S. include eight commodity groups; any of the groups could be prorated to the destination countries as has been done for oilseeds and feeds and fodders.

It also will be noted that the OUTPUT.MPJ file includes command codes and information as well as the accompanying title, headers and footnotes for the master projections from which prorations are to be made. All of this information together with the master projections is written to computer file by MASTERPJ in response to the JCOUTY command, and is read by PRORATPJ as a first step toward setting up and projecting the prorations which have been requested.

```
40  40   2   1   0   1   1
29  29   0   0   5  10   1   1   1   0   0   0   0   0   0   0   0   1   0
 1   8
 1   8
```

Table 2. U. S. Exports of Selected Commodities by Calendar Year

1960 through 1988, with Projections to 1993

1,000 Metric Tons

Period No. Year	Wheat & Flour Totals by Year	Coarse Grains	Rice	Oilseeds	Protein Meal	Feeds & Fodders	Veget. Oils
	Commodity						
Frut,Nuts & Vegs.							

USDA Economic Research Service, Foreign Agricultural Trade of U. S. Calendar Year 1988 Supplement.
Volumes for wheat and coarse grains include flour and products not converted to grain equivalents.

1	1960	15696.	10935.	982.	4252.	642.	374.	777.	1815.
2	1961	19140.	11029.	831.	3843.	651.	444.	504.	1700.
3	1962	16316.	16722.	1048.	4566.	1163.	775.	770.	1846.
4	1963	19488.	15962.	1193.	5076.	1454.	921.	731.	1919.
5	1964	22494.	16914.	1331.	6143.	1721.	909.	980.	1765.
6	1965	19221.	21725.	1549.	6546.	2184.	1231.	929.	1974.
7	1966	24202.	25186.	1346.	7096.	2426.	1209.	602.	2098.
8	1967	18693.	20245.	1826.	7510.	2590.	1004.	644.	2032.
9	1968	17707.	19482.	1890.	8395.	2850.	1322.	582.	1808.
10	1969	13556.	17232.	1911.	8770.	3140.	1490.	625.	2130.
11	1970	18900.	19990.	1788.	12159.	3800.	1903.	984.	2143.
12	1971	17402.	17250.	1480.	11746.	4285.	1619.	1135.	2062.
13	1972	22490.	28117.	2036.	12502.	3852.	1945.	1032.	2339.
14	1973	38466.	41904.	1631.	13500.	4792.	2358.	963.	2579.
15	1974	25971.	37472.	1726.	14161.	5158.	1971.	1300.	2559.
16	1975	31803.	40375.	2139.	13060.	3950.	2392.	859.	2870.
17	1976	27772.	51558.	2107.	15945.	5043.	3229.	1028.	3409.
18	1977	25525.	48490.	2347.	17194.	4293.	4353.	1337.	3002.
19	1978	35896.	56359.	2351.	22537.	6254.	4108.	1500.	3037.
20	1979	35134.	66179.	2335.	22671.	6444.	5149.	1621.	2909.
21	1980	37130.	72970.	3075.	23631.	7427.	6888.	1837.	4147.
22	1981	45482.	65145.	3198.	23651.	6786.	6460.	1651.	4485.
23	1982	41788.	56461.	2574.	27108.	6445.	6141.	1630.	4062.
24	1983	40379.	54640.	2416.	23634.	6740.	7310.	1469.	3688.
25	1984	43335.	58012.	2194.	21155.	4586.	6996.	1623.	3466.
26	1985	26123.	51735.	1961.	17682.	4849.	6710.	1142.	3255.
27	1986	26134.	33049.	2547.	21967.	6093.	9005.	1226.	3637.
28	1987	32071.	49039.	2494.	22044.	6098.	10421.	1221.	3815.
29	1988	41835.	55271.	2298.	18558.	6475.	11336.	1639.	4326.
30	1989	40689.	65495.	2817.	26106.	7432.	9040.	1655.	4200.
31	1990	41562.	67379.	2875.	26888.	7646.	9389.	1691.	4294.
32	1991	42436.	69264.	2932.	27670.	7861.	9739.	1727.	4388.
33	1992	43309.	71149.	2990.	28451.	8075.	10089.	1763.	4482.
34	1993	44182.	73034.	3048.	29233.	8290.	10439.	1799.	4576.

Commands and Headings for the Case (Input.PPJ)

The INPUT.PPJ file of commands, information and titles for the case as created by PRORATE1 is reproduced below. As described in Section V, the file is created from keyboard commands in response to program prompts displayed on the monitor screen. As the starting point, a set of default values is read from the DEFAULT.PRO file in the same order and format as the INPUT.PPJ file.

The first three lines of integer commands in the accompanying file are common to the INPUT.PPJ file for all proration problems. The number and content of the remaining lines of integer and real number commands are functions of the responses indicated on the first three. In this prorate example, the entries include the codes and conversion factors for the conversion prorate table before coming to the listing of the titles and footnotes for the proration tables in the command file. The listing includes ten title lines for the primary proration table plus four title lines for the conversion table followed by the four lines of footnotes for the output tables.

The complete set of commands and headings for the oilseed export prorations is listed first, followed by the set for feed and fodder export prorations.

```
4   0   0   7   0  23   0   0   0  52   0
0   0   1   0   0   0
7   1   2   3   4   5   6   7   0   0   0
            23     .1000
             0     .0000
                                   Table 8.  U.S. Agricultural Exports of Oilseeds by
Country of Destination
                                                          (Unit = 100 Metric Tons)
                                                   Per Year 1982-1988, with Projection
s to 1993

                                                              Country
                                        Table 8A. U.S. Agricultural Exports of
Oilseeds by Country of Destination
                                                          (1,000 Metric Tons)
USDA Economic Research Service, Foreign Agricultural Trade of U.S.  Calendar Yea
r 1988 Supplemen .
Prorations to the Table 2 projections based on the reported data by country of d
estination in Table 8.
6   0   0   7   0  23   0   0   0  52   0
0   0   1   0   0   0
7   1   2   3   4   5   6   7   0   0   0
            23     .1000
             0     .0000
                                   Table 8.  U.S. Agricultural Exports of Feeds & Fodders
by Country of Destination
                                                          (Unit = 100 Metric Tons)
                                                   Per Year 1982-1988, with Projection
s to 1993

                                                              Country
                                        Table 8A. U.S. Agricultural Exports of Feed
s & Fodders by Country of Destination
                                                          (1,000 Metric Tons)
USDA Economic Research Service, Foreign Agricultural Trade of U.S.  Calendar Yea
r 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of d
estination in Table 8.
```

Proration Input Data for the Case (PPJdata.Run)

The accompanying listing of the PPRDATA.RUN file for the U. S. agricultural exports case was developed by the user with EDLIN or with LOTUS in the manner described in Section IV. Being a relatively straight forward example with seven sets of proration input data for two columns in the same master table, this third PPJCase illustrates the pattern of input files for proration projections with

PRORATPJ which alternatively could be developed as master projections from the same time series data used to make the prorations.

In this example, the inceger line of the first data set indicates 11 components (i.e., categories) in the set and 11 components in the subtotal. The header lines identify these 11 components (countries) for which the proration data follow immediately below. The data for the remaining sets follow the same order and pattern as those for the first set.

East Asia

Period								
		11	11					
No.	Year	Japan	S.Korea	Taiwan	China	Hong Kong	Philip.	Indonesia
Thailand		Singapore	Malaysia	Australia	Total			
1	1982	4155.3	589.2	1130.2	246.6	0.3	5.2	392.0
1	1982	0.1	152.9	8.8				0.1
2	1983	4618.4	745.5	1378.0	0.1	0.5	5.5	366.0
2	1983	0.1	94.5	43.3				0.1
3	1984	4266.5	661.4	1315.3	0.1	0.2	2.4	254.8
3	1984	0.1	56.0	45.1				0.1
4	1985	4407.0	828.6	1360.0	63.0	1.4	2.5	51.9
4	1985	0.1	0.1	2.7				0.1
5	1986	4259.1	1014.6	1738.1	124.5	0.5	4.4	52.8
5	1986	0.2	9.0	3.5				0.4
6	1987	3978.3	1142.1	1875.7	429.1	0.4	7.2	125.9
6	1987	0.3	30.6	35.9				1.2
7	1988	3766.3	979.7	1800.5	0.1	0.6	8.4	182.6
7	1988	0.2	42.1	67.1				1.5

Americas

Period								
		11	11					
No.	Year	Mexico	Canada	Venezula	Dom.Rep	Colombia	Peru	Jamaica
Bahamas		El Salvdor	Ecuador	Haiti	Total			
1	1982	930.6	356.0	80.4	24.0	81.2	0.7	62.5
1	1982	0.1	16.7	69.5				1.1
2	1983	1337.7	280.4	55.7	19.6	95.1	8.4	72.4
2	1983	0.1	40.4	46.3				1.8
3	1984	2174.5	324.6	114.5	12.7	98.5	2.4	55.7
3	1984	0.1	23.7	30.9				0.6
4	1985	1263.5	192.4	167.2	33.5	130.5	0.1	45.9
4	1985	0.1	0.1	13.9				0.4
5	1986	1125.0	196.4	161.6	46.5	3.3	15.8	53.1
5	1986	9.3	0.1	4.1				0.2
6	1987	1275.2	224.2	237.2	42.7	199.1	5.3	61.7
6	1987	0.1	0.1	0.5				0.1
7	1988	1368.7	134.7	127.8	29.4	196.6	21.0	37.4
7	1988	0.1	0.2	0.2				0.1

W. Europe

Period								
		11	11					
No.	Year	Spain	Britian	Italy	France	Belgium	Portugal	Switz'land
Ireland		Sweden	Denmark	Holland	Total			
1	1982	3220.3	657.2	943.7	995.7	1486.8	700.4	382.8
1	1982	1.2	143.7	930.6				0.1
2	1983	1952.6	511.7	615.0	546.4	1136.4	870.9	552.2
2	1983	7.4	158.3	1337.7				0.1
3	1984	1656.6	297.5	635.0	612.6	976.2	830.1	258.0
3	1984	0.8	100.4	2174.5				0.1
4	1985	1198.9	399.9	637.1	301.7	534.3	596.7	9.4
4	1985	0.9	72.9	1263.5				0.1
5	1986	1792.5	481.6	747.0	442.4	984.0	567.5	9.8
5	1986	0.8	59.5	1125.0				4.0
6	1987	1741.6	399.7	401.2	438.7	892.8	615.8	6.9
6	1987	0.8	56.1	1275.2				4.2
7	1988	1176.1	516.1	122.6	230.7	590.0	361.2	2.5
7	1988	1.5	46.5	1368.7				0.1

E. Europe

Period							
		5	5				
No.	Year	Poland	Yugoslva	Romania	Germany	USSR	Total
1	1982	99.7	189.9	269.6	2116.3	649.1	
2	1983	195.8	222.7	305.1	1665.6	568.7	

3 1984	73.9	301.6	369.5	843.4	46.2
4 1985	0.1	234.9	97.9	867.1	0.1
5 1986	0.1	178.5	238.9	1182.7	1518.6
6 1987	0.1	139.3	407.9	1464.5	221.4
7 1988	0.1	194.7	237.9	1013.7	750.3
	9	9			

Period

No. Year	Egypt	Middle E. Iraq	Algeria	Saudi A.	Israel	Morocco	Tunisia
Greece	Turkey	Total					
1 1982	53.1	0.1	0.1	0.6	495.2	27.0	0.1	227.5
1 1982	0.3						
2 1983	40.1	0.1	0.1	0.2	477.0	7.2	0.1	264.2
2 1983	0.1						
3 1984	17.6	0.1	0.1	16.7	388.8	8.3	0.1	145.1
3 1984	61.2						
4 1985	0.1	0.1	0.1	1.7	428.9	19.3	0.1	205.7
4 1985	24.5						
5 1986	141.1	0.1	0.1	6.4	397.2	8.8	0.1	207.0
5 1986	10.7						
6 1987	66.2	0.1	0.1	8.6	430.3	25.2	0.1	215.8
6 1987	2.2						
7 1988	58.7	0.5	0.1	4.2	442.3	9.0	0.1	226.8
7 1988	0.8						
	3	3					

Period

No. Year	India	Sub Cont. Pakistan	Bangladesh	Total
1982	0.1	0.2	0.1	
1983	0.1	0.1	0.1	
1984	0.1	0.2	0.1	
1985	0.1	0.1	0.1	
1986	0.1	0.1	0.1	
1987	0.3	0.3	0.1	
1988	25.0	0.8	0.1	
	2	2		

Period

No. Year	Other Areas	Other Products	Other Total	World Total
1 1982	5213.4	0.1		
2 1983	2987.9	0.1		
3 1984	1900.1	0.1		
4 1985	2220.6	0.1		
5 1986	3039.3	0.1		
6 1987	3556.0	0.1		
7 1988	2411.2	0.1		
	11	11		

Period

No. Year	Japan	S.Korea	Taiwan	East Asia China	Hong Kong	Philip.	Indonesia
Thailand	Singapore	Malaysia	Australia	Total			
1 1982	849.9	4.8	83.7	0.3	42.8	12.4	0.6	0.9
1 1982	2.6	1.9	1.4					
2 1983	950.2	11.0	83.5	0.5	32.1	16.8	3.0	1.3
2 1983	6.5	2.3	1.7					
3 1984	1032.7	22.8	143 0	0.2	27.7	9.1	9.0	1.4
3 1984	1.8	2.9	1.3					
4 1985	1102.6	3.4	108.4	0.1	97.0	2.3	30.3	0.9
4 1985	1.9	6.6	1.2					
5 1986	1412.9	19.1	78.0	0.6	25.0	4.1	40.9	1.1
5 1986	1.7	8.0	1.9					
6 1987	1401.3	23.1	74.6	0.4	24.4	3.6	17.0	1.4
6 1987	2.2	9.4	3.5					
7 1988	1849.2	43.9	105.6	2.3	44.4	9.8	31.4	15.3
7 1988	10.0	13.6	11.1					
	11	11						

Period

No. Year	Mexico	Canada	Venezula	Americas Dom.Rep	Colombia	Peru	Jamaica
Bahamas	El Salvdor	Ecuador	Haiti	Total			
1 1982	69.1	236.2	9.1	9.3	1.4	0.9	4.2	28.2
1 1982	10.9	1.2	2.2					
2 1983	31.7	214.3	4.0	1.5	1.7	0.3	3.2	29.9
2 1983	7.8	0.5	2.0					

3 1984	32.5	164.8	4.3	4.7	1.1	0.3	3.5	25.5
3 1984	15.0	0.6	0.4					
4 1985	66.4	233.1	3.2	22.9	0.7	0.5	1.2	22.9
4 1985	15.6	0.6	1.6					
5 1986	46.5	241.9	7.3	17.7	0.8	4.5	1.5	26.4
5 1986	9.5	0.7	1.5					
6 1987	39.3	206.3	5.7	13.6	2.9	5.9	2.8	30.1
6 1987	5.7	1.4	21.7					
7 1988	138.1	274.9	17.2	8.9	1.0	7.1	6.2	29.3
7 1988	2.7	3.8	7.1					
Period	11	11						

No. Year	Spain	Britian	Italy	W. Europe France	Belgium	Portugal	Switz'land
Ireland	Sweden	Denmark	Holland	Total			
1 1982	1.3	213.2	5.6	20.8	10.7	0.3	2.6	11.1
1 1982	7.0	3.7	3823.6					
2 1983	1.5	137.9	42.1	5.4	7.6	0.3	7.3	74.1
2 1983	2.9	7.3	4158.4					
3 1984	0.5	106.5	67.1	12.1	21.4	16.5	6.5	84.6
3 1984	1.5	2.2	4247.8					
4 1985	0.7	121.3	42.5	7.9	3.4	34.6	3.4	124.8
4 1985	0.9	12.4	4027.5					
5 1986	270.3	152.2	181.1	188.4	24.5	360.8	2.5	143.8
5 1986	2.4	9.2	4853.8					
6 1987	375.7	234.3	439.1	425.0	58.9	532.7	2.3	308.8
6 1987	1.2	2.0	4721.6					
7 1988	398.6	332.0	430.1	729.8	12.5	781.1	12.8	420.5
7 1988	1.9	7.2	4497.6					
Period	5	5						

No. Year	Poland	Yugoslva	Romania	Germany	USSR	E. Europe Total
1 1982	0.1	0.1	0.1	464.6	0.1	
2 1983	0.1	0.1	0.1	1248.0	0.1	
3 1984	0.1	0.1	0.1	716.1	0.1	
4 1985	0.1	0.1	0.1	549.7	0.1	
5 1986	0.1	1.9	0.1	689.8	0.1	
6 1987	0.1	0.2	0.1	1085.5	0.1	
7 1988	0.1	0.1	0.1	708.2	0.1	
Period	9	9				

No. Year	Egypt	Middle E. Iraq	Algeria	Saudi A.	Israel	Morocco	Tunisia
Greece	Turkey	Total					
1 1982	1.2	0.1	0.1	12.3	1.2	0.1	0.1	10.3
1 1982	0.1							
2 1983	4.7	0.3	0.1	6.5	0.9	0.1	0.1	1.9
2 1983	0.1							
3 1984	2.8	52.6	0.1	2.5	0.7	0.1	0.1	1.0
3 1984	0.1							
4 1985	4.6	6.9	0.1	0.9	6.8	0.1	0.1	6.7
4 1985	0.1							
5 1986	4.3	14.9	0.1	7.5	9.6	0.1	0.1	0.5
5 1986	0.1							
6 1987	17.2	68.4	0.1	0.2	1.1	0.1	0.1	18.9
6 1987	0.2							
7 1988	2.4	155.9	0.1	2.0	22.3	0.1	0.1	0.3
7 1988	0.1							
Period	3	3						

No. Year	India	Pakistan	Bangladesh	Sub Cont. Total
1 1982	0.8	0.4	0.1	1.2
2 1983	0.8	0.2	0.1	1.0
3 1984	0.2	0.1	0.1	0.2
4 1985	0.3	0.9	0.1	1.2
5 1986	0.3	0.1	0.1	0.3
6 1987	0.3	0.1	0.1	0.3
7 1988	0.8	1.0	0.1	1.9
Period	2	2		

No. Year	Other Areas	Other Products	Other Total	World Total

1	1982	171.3	0.1
2	1983	191.3	0.1
3	1984	143.0	0.1
4	1985	125.4	0.1
5	1986	128.6	0.1
6	1987	223.0	0.1
7	1988	177.8	0.1

Primary Table and Conversion Table Prorations for Oilseed Exports

The 28 accompanying proration tables represent the seven-page primary proration output plus the corresponding conversion prorations (in this case the primary prorations multiplied by a factor of 0.1 to convert to units of 1,000 metric tons) for projections of oilseed and feed and fodder exports. The values for all 52 countries are prorated to one column of historical and projected exports in the master table, that for oilseed exports (and secondly for feed and fodder exports). The full set of prorations for oilseed exports by country of destination is listed first, followed by the 14 proration tables for exports of feeds and fodders.

The primary proration tables include the statistical parameters for each of the columns included in the prorations to the master table. These parameters (Y-bar, b, r-squared, Syz and sb) are based on the trend of that column as a percentage of the column in the master table (in the first case, oilseed exports). For example, the parameters for the first column in Table 8 are .1967, .00398, .08883, .03013, and .00569, respectively. That is, this country, Japan, on average received 19.67 per cent of total U. S. exports of oilseeds, and the percentage is increasing by 0.00398 per cent per year. The trend regression explains about thirty per cent (square root of .08883) of the year-to-year variation around the 19.67 per cent mean. The Syz is .03013 compared to the standard error of estimate (sb) of .00569, indicating statistically significant fit of the regression equation for exports to Japan.

The totals by region appear on the each page of the primary (and conversion) proration tables. The subtotals are obtained by horizontal summation across the respective countries in the table. The grand total of all exports by year appears on the last page of the output for each commodity group; it serves as a check against the column in the master table to which the data are prorated.

Table 8. U.S. Agricultural Exports of Oilseeds by Country of Destination
(Unit - 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Japan	S.Korea	Taiwan	China	Hong Kong	Philip.	Indonesia	Thailand	Singapore	Malaysia	Australia	East As Total
		Country											
23	1982	41552	5892	11302	2466	3	52	3920	1	1	1529	88	66806
24	1983	46184	7455	13780	1	5	55	3660	1	1	945	433	72520
25	1984	426[illegible]	6614	13153	1	2	24	2548	1	1	560	451	66020
26	1985	440[illegible]	8256	13600	630	14	25	519	1	1	1	27	67174
27	1986	42592	10146	17381	1245	5	44	528	4	2	90	35	72072
28	1987	39782	11421	18757	4291	4	72	1259	12	3	306	359	76266
29	1988	37664	9797	18005	1	6	84	1826	15	2	421	671	68492
30	1989	54920	15898	27191	2034	10	100	732	19	4	0	640	101548
31	1990	57283	17682	30074	2246	11	113	342	23	4	0	726	108504
32	1991	59664	19521	33045	2465	12	125	0	27	5	0	815	115679
33	1992	61961	21378	36040	2685	13	138	0	31	5	0	905	123156
34	1993	64061	23206	38981	2901	13	151	0	35	6	0	995	130349
Ybar		.19670	.04031	.07147	.00540	.00003	.00024	.00898	.00002	.00001	.00234	.00141	
b(%)		.00398	.00531	.00845	.00062	.00000	.00004	-.00154	.00001	.00000	-.00063	.00027	
rsq		.08883	.90763	.96364	.03541	.05246	.48467	.38273	.74729	.81046	.46296	.20186	
Syz		.03013	.00401	.00388	.00764	.00003	.00009	.00462	.00002	.00000	.00160	.00126	
sb		.00569	.00076	.00073	.00144	.00000	.00002	.00087	.00000	.00000	.00030	.00024	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

Table 8A. U.S. Agricultural Exports of Oilseeds by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Japan	S.Korea	Taiwan	China	Hong Kong	Philip.	Indonesia	Thailand	Singapore	Malaysia	Australia	East Asia Total
		Country											
23	1982	4155	589	1130	247	0	5	392	0	0	153	9	6680
24	1983	4618	745	1378	0	0	6	366	0	0	95	43	7253
25	1984	4266	661	1315	0	0	2	255	0	0	56	45	6600
26	1985	4407	829	1360	63	1	3	52	0	0	0	3	6718
27	1986	4259	1015	1738	125	1	4	53	0	0	9	4	7208
28	1987	3978	1142	1876	429	0	7	126	1	0	31	36	7626
29	1988	3766	980	1801	0	1	8	183	2	0	42	67	6850
30	1989	5492	1590	2719	203	1	10	73	2	0	0	64	10154
31	1990	5728	1768	3007	225	1	11	34	2	0	0	73	10849
32	1991	5966	1952	3304	246	1	13	0	3	0	0	81	11566
33	1992	6196	2138	3604	268	1	14	0	3	1	0	91	12316
34	1993	6406	2321	3898	290	1	15	0	3	1	0	99	13034

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

Table 8. U.S. Agricultural Exports of Oilseeds by Country of Destination (Continue
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Mexico	Canada	Venezula	Dom.Rep	Colombia	Peru	Jamaica	Bahamas	El Salvdor	Ecuador	Haiti	America Total
		Country											
23	1982	9306	3560	804	240	812	7	625	11	1	167	695	16228
24	1983	13377	2804	557	196	951	84	724	18	1	404	463	19579
25	1984	21745	3246	1145	127	985	24	557	6	1	237	309	28382
26	1985	12635	1924	1672	335	1305	1	459	4	1	1	139	18476
27	1986	11250	1964	1616	465	33	158	531	2	93	1	41	16154
28	1987	12752	2242	2372	427	1991	53	617	1	1	1	5	20462
29	1988	13687	1347	1278	294	1966	210	374	1	1	2	2	19162
30	1989	19085	1852	2794	578	2478	232	598	0	32	0	0	27649
31	1990	20195	1637	3149	647	2804	272	597	0	37	0	0	29338
32	1991	21324	1409	3515	718	3141	314	595	0	42	0	0	31058
33	1992	22434	1168	3887	790	3484	357	591	0	47	0	0	32758
34	1993	23484	912	4254	861	3822	400	585	0	52	0	0	34370
	Ybar	.06400	.01108	.00646	.00141	.00555	.00037	.00255	.00003	.00006	.00050	.00100	
	b(%)	.00247	-.00098	.00109	.00021	.00101	.00013	-.00006	-.00001	.00002	-.00023	-.00046	
	rsq	.06125	.62335	.56748	.52513	.35891	.47017	.13356	.65584	.04281	.50649	.94184	
	Syz	.02289	.00180	.00225	.00047	.00320	.00033	.00035	.00002	.00017	.00053	.00027	
	sb	.00433	.00034	.00043	.00009	.00060	.00006	.00007	.00000	.00003	.00010	.00005	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Oilseeds by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Mexico	Canada	Venezula	Dom.Rep	Colombia	Peru	Jamaica	Bahamas	El Salvdor	Ecuador	Haiti	Americas Total
		Country											
23	1982	931	356	80	24	81	1	62	1	0	17	69	1622
24	1983	1338	280	56	20	95	8	72	2	0	40	46	1957
25	1984	2174	325	114	13	98	2	56	1	0	24	31	2838
26	1985	1264	192	167	34	131	0	46	0	0	0	14	1848
27	1986	1125	196	162	47	3	16	53	0	9	0	4	1615
28	1987	1275	224	237	43	199	5	62	0	0	0	0	2045
29	1988	1369	135	128	29	197	21	37	0	0	0	0	1916
30	1989	1909	185	279	58	248	23	60	0	3	0	0	2765
31	1990	2019	164	315	65	280	27	60	0	4	0	0	2934
32	1991	2132	141	352	72	314	31	60	0	4	0	0	3106
33	1992	2243	117	389	79	348	36	59	0	5	0	0	3276
34	1993	2348	91	425	86	382	40	58	0	5	0	0	3435

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continue

Table 8. U.S. Agricultural Exports of Oilseeds by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Spain	Britian	Italy	France	Belgium	Portugal	Switz'land	Ireland	Sweden	Denmark	Holland	W. Euro Total
		Country											
23	1982	32202	6572	9437	9957	14868	7004	3828	1	12	1437	9306	94624
24	1983	19526	5117	6150	5464	11364	8709	5522	1	74	1583	13377	76887
25	1984	16566	2975	6350	6126	9762	8301	2580	1	8	1004	21745	75418
26	1985	11989	3999	6371	3017	5343	5967	94	1	9	729	12635	50154
27	1986	17925	4816	7470	4424	9840	5675	98	40	8	595	11250	62141
28	1987	17416	3997	4012	4387	8928	6158	69	42	8	561	12752	58330
29	1988	11761	5161	1226	2307	5900	3612	25	1	15	465	13687	44160
30	1989	14810	5977	3300	2590	7775	5851	0	35	6	365	19085	59794
31	1990	13556	6228	2469	1819	7152	5515	0	41	2	197	20195	57174
32	1991	12220	6482	1596	1009	6487	5154	0	47	0	21	21324	54340
33	1992	10789	6726	679	161	5773	4762	0	54	0	0	22434	51378
34	1993	9256	6948	0	0	5007	4333	0	60	0	0	23484	49088
Ybar		.08164	.02149	.02653	.02262	.04234	.02984	.00730	.00006	.00009	.00409	.06400	
b(%)		-.00608	.00041	-.00344	-.00315	-.00306	-.00180	-.00356	.00002	-.00002	-.00067	.00247	
rsq		.53753	.04108	.47729	.71573	.55603	.30583	.68224	.23343	.11456	.80800	.06125	
Syz		.01334	.00471	.00851	.00470	.00647	.00641	.00576	.00009	.00010	.00077	.02289	
sb		.00252	.00089	.00161	.00089	.00122	.00121	.00109	.00002	.00002	.00015	.00433	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Oilseeds by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Spain	Britian	Italy	France	Belgium	Portugal	Switz'land	Ireland	Sweden	Denmark	Holland	W. Europe Total
		Country											
23	1982	3220	657	944	996	1487	700	383	0	1	144	931	9463
24	1983	1953	512	615	546	1136	871	552	0	7	158	1338	7688
25	1984	1657	297	635	613	976	830	258	0	1	100	2174	7541
26	1985	1199	400	637	302	534	597	9	0	1	73	1264	5016
27	1986	1793	482	747	442	984	568	10	4	1	60	1125	6216
28	1987	1742	400	401	439	893	616	7	4	1	56	1275	583.
29	1988	1176	516	123	231	590	361	3	0	2	47	1369	4418
30	1989	1481	598	330	259	778	585	0	4	1	37	1909	5982
31	1990	1356	623	247	182	715	551	0	4	0	20	2019	5717
32	1991	1222	648	160	101	649	515	0	5	0	2	2132	5434
33	1992	1079	673	68	16	577	476	0	5	0	0	2243	5137
34	1993	926	695	0	0	501	433	0	6	0	0	2348	4909

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continue

Table 8. U.S. Agricultural Exports of Oilseeds by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Poland	Yugoslva	Romania	Germany	USSR	E. Europe Total
23	1982	997	1899	2696	21163	6491	33246
24	1983	1958	2227	3051	16656	5687	29579
25	1984	739	3016	3695	8434	462	16346
26	1985	1	2349	979	8671	1	12001
27	1986	1	1785	2389	11827	15186	31188
28	1987	1	1393	4079	14645	2214	22332
29	1988	1	1947	2379	10137	7503	21967
30	1989	0	2473	3737	12839	9527	28576
31	1990	0	2515	3952	12537	10589	29593
32	1991	0	2554	4169	12200	11685	30608
33	1992	0	2587	4383	11810	12790	31570
34	1993	0	2609	4585	11353	13879	32426
	Ybar	.00221	.00984	.01258	.05891	.02426	
	b(%)	-.00111	-.00007	.00047	-.00230	.00316	
	rsq	.57303	.00228	.05264	.13971	.07850	
	Syz	.00227	.00332	.00474	.01351	.02559	
	sb	.00043	.00063	.00090	.00255	.00484	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Oilseeds by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Poland	Yugoslva	Romania	Germany	USSR	E. Europe Total
23	1982	100	190	270	2116	649	3325
24	1983	196	223	305	1666	569	2959
25	1984	74	302	369	843	46	1634
26	1985	0	235	98	867	0	1200
27	1986	0	179	239	1183	1519	3120
28	1987	0	139	408	1464	221	2232
29	1988	0	195	238	1014	750	2197
30	1989	0	247	374	1284	953	2858
31	1990	0	251	395	1254	1059	2959
32	1991	0	255	417	1220	1168	3060
33	1992	0	259	438	1181	1279	3157
34	1993	0	261	459	1135	1388	3243

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continue

Table 8. U.S. Agricultural Exports of Oilseeds by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Egypt	Iraq	Algeria	Saudi A.	Israel	Morocco	Tunisia	Greece	Turkey	Middle E. Total
		Country									
23	1982	531	1	1	6	4952	270	1	2275	3	8040
24	1983	401	1	1	2	4770	72	1	2642	1	7891
25	1984	176	1	1	167	3888	83	1	1451	612	6380
26	1985	1	1	1	17	4289	193	1	2057	245	6805
27	1986	1411	1	1	64	3972	88	1	2070	107	7715
28	1987	662	1	1	86	4303	252	1	2158	22	7486
29	1988	587	5	1	42	4423	90	1	2268	8	7425
30	1989	1066	5	1	100	5815	183	1	2981	104	10257
31	1990	1204	5	1	110	6097	189	1	3158	86	10851
32	1991	1345	6	2	121	6382	195	2	3339	67	11459
33	1992	1489	7	2	132	6659	200	2	3517	48	12056
34	1993	1631	8	2	143	6915	205	2	3686	28	12620
	Ybar	.00244	.00001	.00000	.00026	.02036	.00069	.00000	.00993	.00070	
	b(%)	.00042	.00000	.00000	.00003	.00054	.00001	.00000	.00040	-.00008	
	rsq	.19179	.40803	.40875	.06170	.19570	.00101	.40875	.20834	.02266	
	Syz	.00205	.00001	.00000	.00029	.00258	.00041	.00000	.00186	.00118	
	sb	.00039	.00000	.00000	.00005	.00049	.00008	.00000	.00035	.00022	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Oilseeds by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Egypt	Iraq	Algeria	Saudi A.	Israel	Morocco	Tunisia	Greece	Turkey	Middle E. Total
		Country									
23	1982	53	0	0	1	495	27	0	227	0	803
24	1983	40	0	0	0	477	7	0	264	0	788
25	1984	18	0	0	17	389	8	0	145	61	638
26	1985	0	0	0	2	429	19	0	206	25	681
27	1986	141	0	0	6	397	9	0	207	11	771
28	1987	66	0	0	9	430	25	0	216	2	748
29	1988	59	1	0	4	442	9	0	227	1	743
30	1989	107	0	0	10	582	18	0	298	10	1025
31	1990	120	1	0	11	610	19	0	316	9	1086
32	1991	135	1	0	12	638	19	0	334	7	1146
33	1992	149	1	0	13	666	20	0	352	5	1206
34	1993	163	1	0	14	692	20	0	369	3	1262

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued

Table 8. U.S. Agricultural Exports of Oilseeds by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	India	Pakistan	Bangladesh	Sub Cont. Total
		Country			
23	1982	1	2	1	4
24	1983	1	1	1	3
25	1984	1	2	1	4
26	1985	1	1	1	3
27	1986	1	1	1	3
28	1987	3	3	1	7
29	1988	250	8	1	259
30	1989	200	8	1	209
31	1990	244	9	1	254
32	1991	288	10	2	300
33	1992	334	12	2	348
34	1993	380	13	2	395
	Ybar	.00020	.00001	.00000	
	b(%)	.00014	.00000	.00000	
	rsq	.37980	.45425	.40875	
	Syz	.00044	.00001	.00000	
	sb	.00008	.00000	.00000	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Oilseeds by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: India	Pakistan	Bangladesh	Sub Cont. Total
23	1982	0	0	0	4
24	1983	0	0	0	3
25	1984	0	0	0	4
26	1985	0	0	0	3
27	1986	0	0	0	3
28	1987	0	0	0	7
29	1988	25	1	0	26
30	1989	20	1	0	21
31	1990	24	1	0	25
32	1991	29	1	0	30
33	1992	33	1	0	34
34	1993	38	1	0	39

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued

Table 8. U.S. Agricultural Exports of Oilseeds by Country of Destination
(Unit - 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Other Areas	Other Products	Other Total	World Total
23	1982	52133	1	52134	271082
24	1983	29879	1	29880	236339
25	1984	19001	1	19002	211552
26	1985	22206	1	22207	176820
27	1986	30394	1	30395	219668
28	1987	35559	1	35560	220443
29	1988	24112	1	24113	185578
30	1989	33024	1	33025	261058
31	1990	33163	1	33164	268878
32	1991	33253	2	33255	276699
33	1992	33244	2	33246	284512
34	1993	33083	2	33085	292333
	Ybar	.13768	.00000		
	b(%)	-.00246	.00000		
	rsq	.02744	.40875		
	Syz	.03464	.00000		
	sb	.00655	.00000		

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Oilseeds by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections co 1993

EXPONENT IS 1.00

Period No.	Year	Country: Other Areas	Other Products	Other Total	World Total
23	1982	5213	0	5213	27106
24	1983	2988	0	2988	23633
25	1984	1900	0	1900	21151
26	1985	2221	0	2221	17684
27	1986	3039	0	3039	21969
28	1987	3556	0	3556	22041
29	1988	2411	0	2411	18561
30	1989	3302	0	3302	26107
31	1990	3316	0	3316	26886
32	1991	3325	0	3325	27667
33	1992	3324	0	3324	28450
34	1993	3308	0	3308	29230

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

Primary Table and Conversion Table Prorations for Feeds & Fodders Exports

The 14 proration tables for feeds and fodders exports represent the seven-page primary proration output plus the corresponding conversion prorations (in this case the primary prorations multiplied by a factor of 0.1 to convert to units of 1,000 metric tons). The values for all 52 countries are prorated to one column of historical and projected exports in the master table.

The totals by region appear on each page of the primary (and conversion) proration tables. The subtotals are obtained by horizontal summation across the respective countries in the table. The grand total of all exports by year appears on the last page of the output for each commodity group; it serves as a check against the column in the master table to which the data are prorated.

Table 8. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Japan	S.Korea	Taiwan	China	Hong Kong	Philip.	Indonesia	Thailand	Singapore	Malaysia	Australia	East A Tota
		Country											
23	1982	8504	48	838	3	428	124	6	9	26	19	14	10019
24	1983	9507	110	835	5	321	168	30	13	65	23	17	11094
25	1984	10334	228	1431	2	277	91	90	14	18	29	13	12527
26	1985	10032	34	1085	1	971	23	303	9	19	66	12	12555
27	1986	14138	191	781	6	250	41	409	11	17	80	19	15943
28	1987	14023	231	747	4	244	36	170	14	22	94	35	1562C
29	1988	18504	439	1057	23	444	98	314	153	100	136	111	21379
30	1989	14367	308	691	12	315	0	374	74	40	121	62	16364
31	1990	15222	351	606	14	278	0	434	88	41	140	73	17247
32	1991	16098	397	513	16	238	0	498	103	43	160	84	18150
33	1992	16994	446	411	18	195	0	564	119	44	181	96	19068
34	1993	17911	496	302	20	148	0	634	136	45	203	109	20004
Ybar		.14579	.00204	.01241	.00007	.00555	.00109	.00218	.00032	.00045	.00072	.00034	
b(%)		.00331	.00034	-.00119	.00002	-.00052	-.00029	.00049	.00012	.00000	.00015	.00009	
rsq		.34976	.35849	.29865	.29064	.07035	.61269	.33673	.34366	.00015	.84655	.44220	
Syz		.01066	.00108	.00431	.00006	.00444	.00055	.00163	.00040	.00034	.00016	.00024	
sb		.00202	.00020	.00081	.00001	.00084	.00010	.00031	.00008	.00006	.00003	.00004	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

Table 8A. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 19.'3

EXPONENT IS 1.00

Period No.	Year	Japan	S.Korea	Taiwan	China	Hong Kong	Philip.	Indonesia	Thailand	Singapore	Malaysia	Australia	East Asia Total
		Country											
23	1982	850	5	84	0	43	12	1	1	3	2	1	1002
24	1983	951	11	84	1	32	17	3	1	7	2	2	1111
25	1984	1033	23	143	0	28	9	9	1	2	3	1	1252
26	1985	1003	3	108	0	97	2	30	1	2	7	1	1254
27	1986	1414	19	78	1	25	4	41	1	2	8	2	1595
28	1987	1402	23	75	0	24	4	17	1	2	9	4	1561
29	1988	1850	44	106	2	44	10	31	15	10	14	11	2137
30	1989	1437	31	69	1	31	0	37	7	4	12	6	1635
31	1990	1522	35	61	1	28	0	43	9	4	14	7	1724
32	1991	1610	40	51	2	24	0	50	10	4	16	8	1815
33	1992	1699	45	41	2	19	0	56	12	4	18	10	1906
34	1993	1791	50	30	2	15	0	63	14	5	20	11	2001

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued

Table 8. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Mexico	Canada	Venezula	Dom.Rep	Colombia	Peru	Jamaica	Bahamas	El Salvdor	Ecuador	Haiti	America: Total
		Country											
23	1982	691	2364	91	93	14	9	42	282	109	12	22	3729
24	1983	317	2144	40	15	17	3	32	299	78	5	20	2970
25	1984	325	1649	43	47	11	3	35	255	150	6	4	2528
26	1985	664	2332	32	229	7	5	12	229	156	6	16	3688
27	1986	465	2421	73	177	8	45	15	264	95	7	15	3585
28	1987	393	2064	57	136	29	59	28	301	57	14	217	3355
29	1988	1382	2751	172	89	10	71	62	293	27	38	71	4966
30	1989	690	1790	81	144	10	64	22	194	31	20	108	3154
31	1990	724	1663	85	154	9	76	19	171	10	22	127	3060
32	1991	757	1521	90	164	8	89	16	145	0	25	147	2962
33	1992	792	1364	94	175	7	103	13	117	0	28	169	2862
34	1993	827	1193	98	185	6	117	9	87	0	31	191	2744
Ybar		.00733	.02816	.00086	.00141	.00017	.00029	.00040	.00345	.00131	.00014	.00054	
b(%)		.00008	-.00209	.00001	.00005	-.00001	.00011	-.00004	-.00033	-.00024	.00002	.00016	
rsq		.00215	.46998	.00266	.00905	.15259	.73250	.17870	.96647	.42722	.18924	.24825	
Syz		.00397	.00524	.00049	.00116	.00008	.00015	.00020	.00014	.00066	.00010	.00067	
sb		.00075	.00099	.00009	.00022	.00001	.00003	.00004	.00003	.00012	.00002	.00013	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Mexico	Canada	Venezula	Dom.Rep	Colombia	Peru	Jamaica	Bahamas	El Salvdor	Ecuador	Haiti	Americas Total
		Country											
23	1982	69	236	9	9	1	1	4	28	11	1	2	371
24	1983	32	214	4	2	2	0	3	30	8	1	2	298
25	1984	33	165	4	5	1	0	4	26	15	1	0	254
26	1985	66	233	3	23	1	1	1	23	16	1	2	370
27	1986	47	242	7	18	1	5	2	26	10	1	2	361
28	1987	39	206	6	14	3	6	3	30	6	1	22	336
29	1988	138	275	17	9	1	7	6	29	3	4	7	496
30	1989	69	179	8	14	1	6	2	19	3	2	11	314
31	1990	72	166	9	15	1	8	2	17	1	2	13	306
32	1991	76	152	9	16	1	9	2	15	0	3	15	298
33	1992	79	136	9	17	1	10	1	12	0	3	17	285
34	1993	83	119	10	19	1	12	1	9	0	3	19	276

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Spain	Britian	Italy	France	Belgium	Portugal	Switz'land	Ireland	Sweden	Denmark	Holland	W. Euro Total
		Country											
23	1982	13	2133	56	208	107	3	26	111	70	37	38260	41024
24	1983	15	1380	421	54	76	3	73	741	29	73	41606	44471
25	1984	5	1066	671	121	214	165	65	847	15	22	42507	45698
26	1985	7	1214	425	79	34	346	34	1249	9	124	40299	43820
27	1986	2705	1523	1812	1885	245	3610	25	1439	24	92	48570	61930
28	1987	3760	2345	4394	4253	589	5331	23	3090	12	20	47249	71066
29	1988	3989	3322	4304	7303	125	7816	128	4208	19	72	45005	76291
30	1989	3982	1914	4096	5365	294	6640	57	3540	0	62	36299	62249
31	1990	4825	1962	4903	6514	329	8053	59	4172	0	62	34401	65280
32	1991	5718	2008	5757	7732	365	9550	60	4841	0	61	32261	68353
33	1992	6661	2051	6657	9017	403	11130	62	5545	0	60	29877	71463
34	1993	7653	2093	7604	10371	442	12793	64	6285	0	59	27254	74618
	Ybar	.01456	.02224	.01755	.01903	.00226	.02397	.00064	.01792	.00035	.00080	.54145	
	b(%)	.00738	-.00026	.00695	.01009	.00025	.01238	.00000	.00532	-.00012	-.00003	-.03492	
	rsq	.77849	.00621	.82676	.76270	.09359	.86050	.00035	.91516	.53358	.01255	.77757	
	Syz	.00932	.00788	.00752	.01331	.00183	.01180	.00041	.00383	.00027	.00061	.04420	
	sb	.00176	.00149	.00142	.00252	.00035	.00223	.00008	.00072	.00005	.00011	.00835	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Spain	Britian	Italy	France	Belgium	Portugal	Switz'land	Ireland	Sweden	Denmark	Holland	W. Europe Total
23	1982	1	213	6	21	11	0	3	11	7	4	3826	4103
24	1983	2	138	42	5	8	0	7	74	3	7	4161	4447
25	1984	1	107	67	12	21	17	7	85	2	2	4251	4572
26	1985	1	121	43	8	3	35	3	125	1	12	4030	4362
27	1986	270	152	181	189	25	361	3	144	2	9	4857	6193
28	1987	376	234	439	425	59	533	2	309	1	2	4725	7105
29	1988	399	332	430	730	13	782	13	421	2	7	4500	7629
30	1989	398	191	410	536	29	664	6	354	0	6	3630	6224
31	1990	483	196	490	651	33	805	6	417	0	6	3440	6527
32	1991	572	201	576	773	37	955	6	484	0	6	3226	6836
33	1992	666	205	666	902	40	1113	6	555	0	6	2988	7147
34	1993	765	209	760	1037	44	1279	6	629	0	6	2725	7460

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Poland	Yugoslva	Romania	Germany	USSR	E. Europe Total
		Country					
23	1982	1	1	1	4649	1	4653
24	1983	1	1	1	12486	1	12490
25	1984	1	1	1	7166	1	7170
26	1985	1	1	1	5500	1	5504
27	1986	1	19	1	6903	1	6925
28	1987	1	2	1	10863	1	10868
29	1988	1	1	1	7087	1	7091
30	1989	1	6	1	6141	1	6150
31	1990	1	7	1	5710	1	5720
32	1991	1	8	1	5229	1	5240
33	1992	0	9	0	4698	0	4707
34	1993	0	10	0	4120	0	4130
Ybar		.00001	.00004	.00001	.09633	.00001	
b(%)		.00000	.00001	.00000	-.00709	.00000	
rsq		.83991	.03702	.83991	.18018	.83991	
Syz		.00000	.00008	.00000	.03578	.00000	
sb		.00000	.00002	.00000	.00676	.00000	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Poland	Yugoslva	Romania	Germany	USSR	E. Europe Total
23	1982	0	0	0	465	0	465
24	1983	0	0	0	1249	0	1249
25	1984	0	0	0	717	0	717
26	1985	0	0	0	550	0	550
27	1986	0	2	0	690	0	692
28	1987	0	0	0	1086	0	1086
29	1988	0	0	0	709	0	709
30	1989	0	1	0	614	0	615
31	1990	0	1	0	571	0	572
32	1991	0	1	0	523	0	524
33	1992	0	1	0	470	0	471
34	1993	0	1	0	412	0	413

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continue

Table 8. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Egypt	Iraq	Algeria	Saudi A.	Israel	Morocco	Tunisia	Greece	Turkey	Middle E. Total
		Country									
23	198_	12	1	1	123	12	1	1	103	1	255
24	1983	47	3	1	65	9	1	1	19	1	147
25	1984	28	526	1	25	7	1	1	10	1	600
26	1985	46	69	1	9	68	1	1	67	1	263
27	1986	43	149	1	75	96	1	1	5	1	372
28	1987	172	684	1	2	11	1	1	189	2	1063
29	1988	24	1560	1	20	223	1	1	3	1	1834
30	1989	83	1020	1	0	140	1	1	39	1	1286
31	1990	93	1221	1	0	166	1	1	34	1	1518
32	1991	104	1433	1	0	194	1	1	29	1	1764
33	1992	115	1657	0	0	223	0	0	23	1	2019
34	1993	127	1893	0	0	254	0	0	17	1	2292
	Ybar	.00061	.00437	.00001	.00063	.00065	.00001	.00001	.00071	.00001	
	b(%)	.00008	.00173	.00000	-.00024	.00022	.00000	.00000	-.00007	.00000	
	rsq	.11056	.52599	.83991	.56157	.44615	.83991	.83991	.03646	.11053	
	Syz	.00051	.00388	.00000	.00050	.00059	.00000	.00000	.00084	.00000	
	sb	.00010	.00073	.00000	.00010	.00011	.00000	.00000	.00016	.00000	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Egypt	Iraq	Algeria	Saudi A.	Israel	Morocco	Tunisia	Greece	Turkey	Middle E. Total
23	1982	1	0	0	12	1	0	0	10	0	24
24	1983	5	0	0	7	1	0	0	2	0	15
25	1984	3	53	0	3	1	0	0	1	0	61
26	1985	5	7	0	1	7	0	0	7	0	27
27	1986	4	15	0	8	10	0	0	1	0	38
28	1987	17	68	0	0	1	0	0	19	0	105
29	1988	2	156	0	2	22	0	0	0	0	182
30	1989	8	102	0	0	14	0	0	4	0	128
31	1990	9	122	0	0	17	0	0	3	0	151
32	1991	10	143	0	0	19	0	0	3	0	175
33	1992	12	166	0	0	22	0	0	2	0	202
34	1993	13	189	0	0	25	0	0	2	0	229

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continue

Table 8. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	India	Pakistan	Bangladesh	Sub Cont. Total
		Country			
23	1982	8	4	1	13
24	1983	8	2	1	11
25	1984	2	1	1	4
26	1985	3	9	1	13
27	1986	3	1	1	5
28	1987	3	1	1	5
29	1988	8	10	1	19
30	1989	1	5	1	7
31	1990	0	5	1	6
32	1991	0	5	1	6
33	1992	0	6	0	6
34	1993	0	6	0	6
	Ybar	.00006	.00005	.00001	
	b(%)	-.00001	.00000	.00000	
	rsq	.39043	.00243	.83991	
	Syz	.00004	.00005	.00000	
	sb	.00001	.00001	.00000	

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: India	Pakistan	Bangladesh	Sub Cont. Total
23	1982	1	0	0	1
24	1983	1	0	0	1
25	1984	0	0	0	0
26	1985	0	1	0	1
27	1986	0	0	0	0
28	1987	0	0	0	0
29	1988	1	1	0	2
30	1989	0	0	0	0
31	1990	0	1	0	1
32	1991	0	1	0	1
33	1992	0	1	0	1
34	1993	0	1	0	1

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued

Table 8. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(Unit = 100 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Other Areas	Other Products	Other Total	World Total
23	1982	1714	1	1715	61408
24	1983	1914	1	1915	73098
25	1984	1431	1	1432	69959
26	1985	1255	1	1256	67099
27	1986	1287	1	1288	90048
28	1987	2232	1	2233	104210
29	1988	1779	1	1780	113360
30	1989	1191	1	1192	90402
31	1990	1061	1	1062	93893
32	1991	918	1	919	97394
33	1992	762	0	762	100887
34	1993	593	0	593	104387
	Ybar	.02066	.00001		
	b(%)	-.00187	.00000		
	rsq	.64075	.83991		
	Syz	.00331	.00000		
	sb	.00063	.00000		

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

(Continued)

Table 8A. U.S. Agricultural Exports of Feeds & Fodders by Country of Destination
(1,000 Metric Tons)

Per Year 1982-1988, with Projections to 1993

EXPONENT IS 1.00

Period No.	Year	Country: Other Areas	Other Products	Other Total	World Total
23	1982	171	0	171	6137
24	1983	191	0	191	7312
25	1984	143	0	143	6999
26	1985	125	0	125	6709
27	1986	129	0	129	9008
28	1987	223	0	223	10416
29	1988	178	0	178	11333
30	1989	119	0	119	9035
31	1990	106	0	106	9387
32	1991	92	0	92	9741
33	1992	76	0	76	10088
34	1993	59	0	59	10439

SOURCE:
USDA Economic Research Service, Foreign Agricultural Trade of U.S. Calendar Year 1988 Supplement.
Prorations to the Table 2 projections based on the reported data by country of destination in Table 8.

SECTION X

ILLUSTRATION OF AGRICULTURAL DEVELOPMENT ANALYSIS (PPJCASE.AGR)

Concept of Agricultural Development Analysis

Many kinds of potential agricultural irrigation and land reclamation development projects have characteristics which warrant special application of the MASTERPJ and PRORATPJ programs. In particular, several different kinds of transitions toward full development and full production need to be superimposed in order to obtain realistic estimates of the time flow of benefits and costs for such projects.

Benefits from agricultural development projects are estimated by comparing projected total net incomes of benefitted farmers after the project with the projected total net incomes of the same farmers without the project. Added net incomes of benefitted farmers depend upon (a) the increased hectarages they are able to crop, and (b) the increased yields they are able to obtain on hectarages already cropped. In computing benefits from the two sources, care must be taken not to credit the project with increased farm incomes brought about by factors other than the project, but to give full credit to the increases resulting from the project.

Components of Project Benefits

There are three components of added farm incomes from agricultural development projects when interactions of hectarages and yields are considered. They are:

1. Added hectarage multiplied by existing yields
2. Existing hectarage multiplied by added yields
3. Added hectarage multiplied by added yields.

Total added agricultural production is determined by the sum of added area times existing yield plus existing area times added yield plus added area times added yield. Because added yield is common to the last two of these terms, and because total project area equals existing area plus added area, the expression for total project impact can be restated as added areas times existing yields (area effect) plus total areas times added yields (yield effect).

Added production cannot be aggregated across years (i), types of cultivation (j), seasons (k), nor crops (l), because added areas, existing yields, total project areas and added yields vary with each one. The computations of agricultural benefits need to be made separately by ijkl cell, with aggregation across the jkl cells after applying farm prices and production costs for added net crop revenues. Aggregation across years is not done, because benefits are needed by year (i) in order to employ present value analysis. The methods for projecting agricultural benefits are designed accordingly.

Separate tables are needed for summarizing land area and intensity impacts (Benefits A) and for summarizing yield impacts (Benefits B) of the project. Potential total annual benefits from the respective sources are summations of the projected added net farm revenue for all types of cultivation, all seasons and all crops. These potential benefits are a function of the development schedule, and need not be carried beyond the time when full development is reached. The values reflect

multiplication of per hectare values by numbers of hectares developed by ijkl category.

The other information needed to project annual benefits is the schedule of transition to full yield potentials once the development reaches the farm. Transition factors appropriate to the source of agricultural benefit and type of development project can be established in the planning process. Such factors reflect expected shifts in land use and cropping patterns as well as the increase in yields through time.

Sequential Steps in Projecting Agricultural Benefits

Some 12 distinct steps are needed to complete projections of benefits from agricultural land development projects. These steps (and corresponding output tables) are as follows:

Number	Content	Variables*
1.	Annual Transition to Increased Production	Type of Development, A, B
2.	Land Area to Be Developed	ijk; c,b
3.	Per Hectare Production Costs	jkl; a,c
4.	Potential per Hectare Crop Yields	jkl; a,c
5.	Projected Real Farm Prices	market, border; l
6.	Labor Requirements per Hectare	jkl; a,c
7.	Projected Cropping Pattern	jkl; c,b; i-transition
8.	Gross Income per Hectare	jkl; a,c
9.	Developed Areas for Cropping	jkl; c,b
10.	Net Farm Income per Hectare	jkl; a,c
11.	Potential Net Farm Income Added by Project	jkl; A, B
12.	Added Net Farm Income After Transition	A, B

* A - Hectarage benefit, B - Yield benefit.
ijkl: i - year, j - type of cultivation, k - season, l - crop.
abc: a - without project, b - with project, c - added by project.

The first seven of the sequential steps are determined from the land development plan and the physical characteristics together with agro-economic conditions for the project area. They serve as data input to the projections. Examples of such computations are included for the PPJCase.Agr based on Medium Irrigation Schemes in Rajasthan, India. The MASTERPJ output from sequential steps 11 and 12 for benefits arising from added yields is used as basis for prorating the projections for vegetables to individual vegetable crops. Steps 8 through 12 were completed with the Master Projection Program, as illustrated by the MPJCase.Agr outlined in Section X of the companion manual for use with MASTERPJ.

The added net farm income after yield transition (Table 12) can be set up as a Y-table run with MASTERPJ if the yield transition pattern is the same for different crops. Columns in the 12A and 12B tables can be prorated to components with PRORATPJ to reflect the transition pattern. Alternatively, the master projection tables 11A and 11B can be used as basis for the prorations, and the transition

routine of PRORATPJ used to reflect the values for the components after transition. The MASTERPJ run is set up as Y = X1 + X2 + ... + Xn, where X1 through Xn represent the Tables 11 for the individual season-type of cultivation combinations. The master Y-table is the Table 11 total for all seasons and types of cultivation. The corresponding Table 12 is developed as a special transition conversion table, using JCOUTY = 2 for yield transitions and entering the transition factors at the step for CONVRT multipliers. As with Table 11, separate Tables 12A and 12B are generated. For prorations to columns in Table 12 after transition, the PRORATPJ run is set up in the normal manner. For prorations to columns in Table 11 and generation of the transition proration table with PRORATPJ, the run is set up using ITRANS = 1 and entering the transition factors at step 6 (Screen 6 of PRORATE1).

Components of Project Costs

The methodology for projecting components of capital and operating costs for agricultural land development projects is not unique. For most such projects the major cost components include those for major works, those for distribution networks, and those for on-farm development. Standard methods can be used for developing cost estimates for all three components.

The Rajasthan Agricultural Land Development Case

General Description

The examples from the Gudha Medium Irrigation Project in Rajasthan, India illustrate proration to sub-components in the last step for measurement of benefits through yield impacts for land development cases, Table 12B. The transition pattern for the Gudha Project in Table 1 is used for the prorations after reflection of yield transitions. The case is based on USAID-supported technical assistance by the Kansas State University Food and Feed Grains Institute to the State of Rajasthan and the Government of India some years ago.*

The Gudha Project examples in this manual both are for computation of Table 12-B1 prorations for the summation of all season-type of cultivation combinations after reflecting yield transitions for the 14 projected periods, 1988 through 2001. The first example is a direct proration to the vegetables column of the corresponding Table 12B generated with MASTERPJ. The second is a proration to the Master Projection output Table 11B, with the transition table generated directly by PRORATPJ to produce Table 12-B1. The latter serves to illustrate the use of the ITRANS feature of PRORATE1 and PRORATPJ.

Transition Factors for the Case

Transition factors under the three levels of land development for the Gudha Project area in Rajasthan, India are shown below in Table 1. For each level of development, separate transition factors are listed for (a) the added areas for cultivation and (b) the added yields.

---

* See Mehta, U.R., and Phillips, Richard. Guidelines for Economic Evaluation of Medium Irrigation Projects, Including IRR Calculations. State of Rajasthan. Jaipur. 1982.

The Gudha Project is a full modernization project so that the transition factors in the center columns of Table 1 are relevant. For the yield transition examples included herein, the factors in Column B under full modernization are used. The factors are entered incrementally rather than as the cumulative values shown in the table. That is, the values entered by year are .00, .10, .20, .30, .20, .20, .00, .00, .00 and .00.

Table 1. Annual Transition to Total Increase in Agricultural Production (Fraction of Full Impact)

Year Following Development	New Projects		Full Modernization		Partial Modernization	
	A. Area	B. Yield	A. Area	B. Yield	A. Area	B. Yield
0	.80	.00	.75	.00	.85	.00
1	.82	.08	.775	.10	.90	.15
2	.84	.20	.825	.30	.95	.40
3	.88	.40	.90	.60	.98	.75
4	.92	.60	.95	.80	1.00	.90
5	.96	.80	1.00	1.00	1.00	1.00
6	.99	.95	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00

Example 1, Proration Directly to MASTERPJ Output Table 12B

Example 1 represents the computation of Table 12-B1, Combined Net Farm Income Added by Project through Benefit B, After Reflecting Yield Transitions by direct proration to the vegetables column of the corresponding Master Projection output Table 12-B. The run is set up as a straight proration with PRORATPJ, using projected percentages by year over the planning horizon to break down the vegetables category to individual vegetable crops.

Listing of the OUTPUT.MPJ File for the Example

The commands, headings and Master Projection output for the PPJCase.Agr, Example 1, as contained in the OUTPUT.MPJ file developed in the MASTERPJ run to produce Table 12B for the Gudha Project are listed below. The four rows of numbers represent MASTERPJ input commands. They are followed by the title lines, column headers and footnotes, and then the Table 12B output data.

```
40  40   1   1   0   1   1
14  14   0   0   0  13   2   1   7   0   0   1   0   0   0   0   1   1   0
 2   8   3
 1  11
```

Table 12B. Combined Net Farm Income Added by P
roject through Benefit B
After Reflecting Table 1 Yield Tr
ansition
GUDHA PROJECT
Unit = Rs. 100
Total of All Cultivations in Both Rabi and
Kharif Seasons
Period

No.	Year	Wheat	Barley	Pulses	Total Oilseeds	Vegetables	Paddy	Sugar Cane	Condiments	Fodder	Cotton	Other	All Crops

Summation of Tables 11B by season and type of cultivation for Benefit B.

Transition to full production based on the schedule in Table 1.

1	1988	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	1989	1503.	99.	190.	189.	109.	34.	1368.	56.	171.	0.	0.	0.
3	1990	4172.	461.	735.	819.	467.	116.	4348.	214.	493.	0.	0.	0.
4	1991	7800.	1191.	1738.	2064.	1186.	252.	9162.	504.	952.	0.	0.	0.
5	1992	9431.	2075.	2796.	3561.	2084.	374.	13274.	815.	1207.	0.	0.	0.
6	1993	11295.	2880.	3758.	5013.	3019.	490.	17781.	1111.	1479.	0.	0.	0.
7	1994	10512.	3354.	4188.	5954.	3729.	533.	19953.	1264.	1426.	0.	0.	0.
8	1995	10466.	3473.	4253.	6249.	4214.	536.	21811.	1331.	1428.	0.	0.	0.
9	1996	10839.	3365.	4093.	6578.	4509.	506.	23163.	1342.	1462.	0.	0.	0.
10	1997	11076.	3263.	3962.	6708.	4734.	455.	23847.	1360.	1501.	0.	0.	0.
11	1998	11199.	3191.	3874.	6796.	4878.	413.	24129.	1373	1529.	0.	0.	0.
12	1999	11222.	3146.	3827.	6846.	4943.	375.	24106.	1385.	1548.	0.	0.	0.
13	2000	11229.	3134.	3814	6860.	4961.	364.	23984.	1389.	1554.	0.	0.	0.
14	2001	11229.	3134.	3814.	6860.	4961.	364.	23984.	1389.	1554.	0.	0.	0.

Listing of the INPUT.PPJ File for the Example

The commands and headings for the PPJCase.Agr, Example 1, as contained in the INPUT.PPJ file for use in the PRORATPJ run are listed below. The three rows of numbers represent input commands. They are followed by the title lines, column headers and footnotes for the proration table.

```
5   0   0  14   0   1   0   0   0   8   0
1   0   0   1   0   0
1   0   0   0   0   0   0   0   0   0   0
```

Table 12-B1. Combined Net Farm Income Added by Project thr
ough Benefit B
After Reflecting Table 1 Yield Transition
by Vegetable Crop, Gudha Project
Unit = Rs. 10
Total of All Cultivations in Both Rabi and Khariff Seasons
Based on Master Projection summary Table 11B before reflecting yield transition.
Transition to full production based on the schedule in Table 1.

Table of Input Data for the Example

The table of input data for Example 1 as contained in the PPJDATA.RUN file for the case is listed below. The input represents an ASCII file in the format of I3, 1X, I4, 8F9.0. The file contains the data for prorating the vegetable crops column in the master table to projected added net earnings for the individual vegetable crops.

Period	Beets	Cucumbers	Eggplant	Okra	Onions	Peppers	Tomatoes
Other	Total						
1 1988	6.3	13.6	15.1	10.0	12.8	7.9	18.7	15.6
2 1989	6.3	13.5	14.9	9.9	13.0	8.0	18.6	15.8
3 1990	6.3	13.6	14.7	9.8	12.9	8.2	18.5	16.0
4 1991	6.3	13.6	14.5	9.7	12.9	8.4	18.4	16.2
5 1992	6.3	13.6	14.3	9.6	12.9	8.6	18.3	16.4
6 1993	6.3	13.7	14.1	9.5	12.8	8.8	18.2	16.6
7 1994	6.3	13.7	13.9	9.4	12.8	9.0	18.1	16.8
8 1995	6.2	13.8	13.7	9.4	12.7	9.2	18.0	17.0
9 1996	6.1	13.8	13.5	9.4	12.7	9.2	18.1	17.2
10 1997	6.0	13.8	13.3	9.4	12.7	9.2	18.2	17.4
11 1998	5.9	13.9	13.1	9.4	12.6	9.2	18.3	17.6
12 1999	5.8	13.9	12.9	9.4	12.6	9.2	18.4	17.8
13 2000	5.7	13.9	12.7	9.4	12.6	9.2	18.5	18.0
14 2001	5.6	13.9	12.5	9.4	12.6	9.2	18.6	18.2

Listing of the PRORATPJ Output for Example 1

The program output based on direct prorations to the Master Projection Table 12B as created in the Example 1 PRORATPJ run is shown below as Table 12-B1. Following the pattern of the master table, no projections beyond the data years are made, since the entire table for 1988 through 2001 represents a projection, including the transition in yields from Table 1, above.

Table 12-B1. Combined Net Farm Income Added by Project through Benefit B After Reflecting Table 1 Yield Transition

by Vegetable Crop, Gudha Project

Unit = Rs. 10

Total of All Cultivations in Both Rabi and Khariff Seasons

Period	Beets	Cucumbers	Eggplant	Okra	Onions	Peppers	Tomatoes	Other	Total
1 1988	0	0	0	0	0	0	0	0	0
2 1989	69	147	162	108	142	87	203	172	1090
3 1990	294	635	686	458	602	383	864	747	4669
4 1991	747	1613	1720	1150	1530	996	2182	1921	11859
5 1992	1313	2834	2980	2001	2688	1792	3814	3418	20840
6 1993	1902	4136	4257	2868	3864	2657	5495	5012	30191
7 1994	2349	5109	5183	3505	4773	3356	6749	6265	37289
8 1995	2613	5815	5773	3961	5352	3877	7585	7164	42140
9 1996	2750	6222	6087	4238	5726	4148	8161	7755	45087
10 1997	2840	6533	6296	4450	6012	4355	8616	8237	47339
11 1998	2878	6780	6390	4585	6146	4488	8927	8585	48779
12 1999	2867	6871	6376	4646	6228	4548	9095	8799	49430
13 2000	2828	6896	6300	4663	6251	4564	9178	8930	49610
14 2001	2778	6896	6201	4663	6251	4564	9227	9029	49609
Ybar	.06100	.13736	.13800	.09550	.12757	.08807	.18350	.16900	
b(%)	-.00055	.00032	-.00200	-.00045	-.00029	.00108	-.00011	.00200	
rsq	.83076	.91747	1.00002	.76068	.81953	.83592	.04433	1.00005	
Syz	.00109	.00042	.00000	.00109	.00059	.00208	.00218	.00000	
sb	.00007	.00003	.00000	.00007	.00004	.00014	.00014	.00000	

SOURCE:
Based on Master Projection summary Table 11B before reflecting yield transition.
Transition to full production based on the schedule in Table 1.

Example 2, Transition Proration by PRORATPJ to MASTERPJ Output Table 11B

Example 2 represents the computation of Table 12-B1, Combined Net Farm Income Added by Project through Benefit B, After Reflecting Yield Transitions by proration to the vegetables column of Master Projection output Table 11B, and then fitting the yield transitions with PRORATPJ. The run is set up as a transition proration with PRORATPJ, using projected percentages by year over the planning horizon to break down the vegetables category in Table 11B to individual vegetable crops (Table 11-B1), and then fitting the yield transitions to this PRORATPJ output table.

Listing of the OUTPUT.MPJ File for the Example

The commands, headings and Master Projection output for the PPJCase.Agr, Example 2, as contained in the OUTPUT.MPJ file developed in the MASTER1 run used to produce Table 11B for the Gudha Project are listed below. The four rows of numbers represent MASTERPJ input commands. They are followed by the title lines, column headers and footnotes, and then the Table 11B output data.

```
40  40   1   1   0   1   1
14  14   0   0   0  13   2   1   7   0   0   1   0   0   0   0   1   1   0
 2   8   3
 1  11
```

```
                                        Table 11B. Combined Net Farm Income Added by P
roject through Benefit B
                                                  Before Reflecting Table 1 Yield Tr
ansition
                                                              GUDHA PROJECT
                                                            Unit = Rs. 100
                                        Total of All Cultivations in Both Rabi and
Kharif Seasons
 Period                                                                          Sugar
                                                  Total
 No. Year      Wheat      Barley      Pulses  Oilseeds  Vegetables  Paddy       Cane
Condiments     Fodder     Cotton      Other   All Crops
Summation of Tables 11B by season and type of cultivation for Benefit B.

Transition to full production based on the schedule in Table 1.
```

1	1988	15029.	992.	1902.	1894.	1086.	339.	13682.	563.	1713.
2	1989	11662.	2633.	3554.	4399.	2497.	480.	16123.	1014.	1498.
3	1990	9589.	3655.	4556.	6160.	3613.	539.	18324.	1324.	1376.
4	1991	10084.	3560.	4391.	6304.	3951.	544.	20364.	1326.	1401.
5	1992	10627.	3461.	4219.	6451.	4291.	552.	22496.	1326.	1427.
6	1993	11116.	3362.	4048.	6610.	4635.	555.	24548.	1331.	1458.
7	1994	11196.	3196.	3879.	6792.	4870.	418.	24144.	1372.	1526.
8	1995	11228.	3133.	3814.	6859.	4962.	363.	23984.	1388.	1553.
9	1996	11228.	3133.	3814.	6859.	4962.	363.	23984.	1388.	1553.
10	1997	11228.	3133.	3814.	6859.	4962.	363.	23984.	1388.	1553.
11	1998	11228.	3133.	3814.	6859.	4962.	363.	23984.	1388.	1553.
12	1999	11228.	3133.	3814.	6859.	4962.	363.	23984.	1388.	1553.
13	2000	11228.	3133.	3814.	6859.	4962.	363.	23984.	1388.	1553.
14	2001	11228.	3133.	3814.	6859.	4962.	363.	23984.	1388.	1553.

Listing of the INPUT.PPJ File for the Example

The commands and headings for the PPJCase.Agr, Example 2, as contained in the INPUT.PPJ file for use in the PRORATPJ run are listed below. The first three rows of numbers represent input commands. The fourth row of numbers contains the yield transition factors (entered incrementally) from Table 1. This is followed by the title lines, column headers and footnotes for the proration table.

```
5   0   0  14   0   1   0   0   1   8   0
1   0   0   1   0   0
1   0   0   0   0   0   0   0   0   0   0
0.0   0.10   0.20   0.30   0.20   0.20   0.00   0.00   0.00   0.00
```

Table 11-B1. Combined Net Farm Income Added by Project through Benefit B

Before Reflecting Table 1 Yield Transition

by Vegetable Crop, Gudha Project

Unit = Rs. 10

Total of All Cultivations in Both Rabi and Khariff Seasons

Table 12-B1. Combined Net Farm Income Added by the Project through Benefit B

After Reflecting Table 1 Yield Transitions

Summation of Tables 11B by season and type of cultivation for Benefit B.

Transition to full production based on the schedule in Table 1.

Table of Input Data for the Example

The table of input data for Example 2 as contained in the PPJDATA.RUN file for the case is listed below. The input represents an ASCII file in the format of I3, 1X, I4, 8F9.0. It will be noted that this file is identical to the corresponding input data table for Example 1, above.

```
                8        8
```

Period	Beets	Cucumbers	Eggplant	Okra	Onions	Peppers	Tomatoes	Other Total
1 1988	6.3	13.6	15.1	10.0	12.8	7.9	18.7	15.6
2 1989	6.3	13.5	14.9	9.9	13.0	8.0	18.6	15.8
3 1990	6.3	13.6	14.7	9.8	12.9	8.2	18.5	16.0
4 1991	6.3	13.6	14.5	9.7	12.9	8.4	18.4	16.2
5 1992	6.3	13.6	14.3	9.6	12.9	8.6	18.3	16.4
6 1993	6.3	13.7	14.1	9.5	12.8	8.8	18.2	16.6
7 1994	6.3	13.7	13.9	9.4	12.8	9.0	18.1	16.8
8 1995	6.2	13.8	13.7	9.4	12.7	9.2	18.0	17.0
9 1996	6.1	13.8	13.5	9.4	12.7	9.2	18.1	17.2
10 1997	6.0	13.8	13.3	9.4	12.7	9.2	18.2	17.4
11 1998	5.9	13.9	13.1	9.4	12.6	9.2	18.3	17.6
12 1999	5.8	13.9	12.9	9.4	12.6	9.2	18.4	17.8
13 2000	5.7	13.9	12.7	9.4	12.6	9.2	18.5	18.0
14 2001	5.6	13.9	12.5	9.4	12.6	9.2	18.6	18.2

Listing of the PRORATPJ Output for Example 2

The program output for proration Tables 11-B1 and 12-B1 from PRORATPJ prorations to the vegetable column of Master Projection Table 11B is shown below. The main proration table, Table 11-B1 for projected added net incomes before reflecting yield transitions, is shown first. It was generated in the same manner by direct proration as was the Table 12-B1 in Example 1, shown above.

The transition proration table, Table 12-B1, shown for Example 2 was produced from the just generated Table 11-B1, and in the same run, with the ITRANS routine of PRORATPJ. It will be noted that the results are comparable to those obtained in Example 1. The generation of such results in Example 2 illustrates the procedure for developing multiple transition prorations in cases for which transition output such as Table 12B may not be generated by MASTERPJ.

Table 11-B1. Combined Net Farm Income Added by Project through Benefit B Before Reflecting Table 1 Yield Transition

by Vegetable Crop, Gudha Project

Unit = Rs. 10
Total of All Cultivations in Both Rabi and Khariff Seasons

Period	Beets	Cucumbers	Eggplant	Okra	Onions	Peppers	Tomatoes	Other	Total
1 1988	684	1477	1640	1086	1390	858	2031	1694	10860
2 1989	1573	3371	3721	2472	3246	1998	4644	3945	24970
3 1990	2276	4914	5311	3541	4661	2963	6684	5781	36131
4 1991	2489	5373	5729	3832	5097	3319	7270	6401	39510
5 1992	2703	5836	6136	4119	5535	3690	7853	7037	42909
6 1993	2920	6350	6535	4403	5933	4079	8436	7694	46350
7 1994	3068	6672	6769	4578	6234	4383	8815	8182	48701
8 1995	3076	6848	6798	4664	6302	4565	8932	8435	49620
9 1996	3027	6848	6699	4664	6302	4565	8981	8535	49621
10 1997	2977	6848	6599	4664	6302	4565	9031	8634	49620
11 1998	2928	6897	6500	4664	6252	4565	9080	8733	49619
12 1999	2878	6897	6401	4664	6252	4565	9130	8832	49619
13 2000	2828	6897	6302	4664	6252	4565	9180	8932	49620
14 2001	2779	6897	6203	4664	6252	4565	9229	9031	49620
Ybar	.06100	.13736	.13800	.09550	.12757	.08807	.18350	.16900	
b(%)	-.00055	.00032	-.00200	-.00045	-.00029	.00108	-.00011	.00200	
rsq	.83076	.91747	1.00002	.76068	.81953	.83592	.04433	1.00005	
Syz	.00109	.00042	.00000	.00109	.00059	.00208	.00218	.00000	
sb	.00007	.00003	.00000	.00007	.00004	.00014	.00014	.00000	

SOURCE:
Summation of Tables 11B by season and type of cultivation for Benefit B.
Transition to full production based on the schedule in Table 1.

Table 12-B1. Combined Net Farm Income Added by the Project through Benefit B After Reflecting Table 1 Yield Transitions

by Vegetable Crop, Gudha Project

Unit = Rs. 10
Total of All Cultivations in Both Rabi and Khariff Seasons

Period	Beets	Cucumbers	Eggplant	Okra	Onions	Peppers	Tomatoes	Other	Total
1 1988	0	0	0	0	0	0	0	0	0
2 1989	68	148	164	109	139	86	203	169	1086
3 1990	294	632	700	464	603	372	870	734	4669
4 1991	748	1608	1767	1174	1532	953	2206	1875	11863
5 1992	1313	2826	3079	2050	2694	1696	3863	3319	20840
6 1993	1903	4102	4425	2951	3898	2494	5579	4846	30198
7 1994	2350	5071	5406	3616	4810	3135	6862	6041	37291
8 1995	2655	5746	6033	4049	5422	3618	7715	6904	42142
9 1996	2837	6166	6368	4293	5783	3960	8212	7475	45094
10 1997	2963	6494	6595	4477	6054	4239	8586	7940	47348
11 1998	3024	6713	6700	4595	6215	4433	8828	8276	48784
12 1999	3025	6818	6694	4647	6283	4530	8957	8483	49437
13 2000	2987	6863	6620	4664	6286	4566	9020	8614	49620
14 2001	2937	6878	6520	4664	6271	4566	9070	8713	49619

SOURCE:
Summation of Tables 11B by season and type of cultivation for Benefit B.
Transition to full production based on the schedule in Table 1.

APPENDIX A

LISTING OF THE PRORATE1 SOURCE PROGRAM

```
C
C     PRORATE PROJECTION PROGRAM -- PRORATE1 FOR READING SCREENS
C
C                 PROFESSOR RICHARD PHILLIPS
C             DEPARTMENT OF AGRICULTURAL ECONOMICS
C                   KANSAS STATE UNIVERSITY
C
      DIMENSION BCOEF(10),FACTOR(10),IDIST(10),IEXCP(10),DOCOUN(80),
     1PARHED(80),CONVRT(180),IHEAD(200)
    2 FORMAT (2I3)
    3 FORMAT (20I4)
    4 FORMAT (' ',132('_'))
    5 FORMAT ('/')
    6 FORMAT (13X,I4,5X,I4)
    9 FORMAT (11I4)
   19 FORMAT (' ',6X,'RSQ',12F10.4)
   24 FORMAT (' ',33A4)
   77 FORMAT (' ',I4,1X,I4,12I10)
   78 FORMAT (,I4,1X,I4,12F9.0)
   96 FORMAT (20A4)
   98 FORMAT (8X,8F9.0/8X,4F9.0)
   99 FORMAT (8X,8F9.0)
  103 FORMAT (F9.2)
  105 FORMAT (13X,I4,F9.4)
  106 FORMAT (17X,F9.4)
  312 FORMAT (8X,8(5X,I4)/4X,I4,8(5X,I4))
  511 FORMAT (10F7.5)
      NREAD = 1
      NFILE = 2
      ICONCU = 0
      LAP = 0
      LTRIP = 0
      DO 7 I = 1,10
      IDIST(I) = 0
      IEXCP(I) = 0
      BCOEF(I) = 0.0
      FACTOR(I) = 0.0
    7 CONTINUE
      DO 8 I = 1,180
    8 CONVRT(I) = 0.0
      OPEN (1,FILE='DEFAULT.PRO',STATUS='OLD')
      WRITE (0,151)
  151 FORMAT (/15X,'PRORATION PROJECTION PROGRAM WITH USER OPTIONS'
     1 /26X,'Professor Richard Phillips'/21X,'Department of Agricultural
     2 Economics'/27X,'Kansas State University'//5X,'* This program read
     3s default command instructions from the DEFAULT.PRO'/7X,'disk file
     4 for screen display to guide the user in keyboard entry of'/7X,
     5'corresponding commands and information for his problem.'//5X,
```

```
      6'* The program then reads the user-supplied information from the s
      7creen'/7X,'and creates the INPUT.PPJ file of this command informat
      8ion for'/7X,  'use in the PRORATPJ run.'//5X,'* The INPUT.PPJ file
      9 created by this program follows the same format'/7X,      'as the
      A DEFAULT.PRO file.  This enables the user who needs to make no'/
      B7X,'changes from the previous commands to simply rename the file'/
      C7X,'(with DOS) rather than using PRORATE1 to build the INPUT.PPJ f
      Dile'/7X,'for the PRORATPJ run.'/)
       PAUSE
       WRITE (0,48)
   48 FORMAT (20(/))
C
C   I.  READ DEFAULT COMMANDS AND HEADINGS FROM THE DEFAULT.PRO FILE
C
C     1. Read Commands for Type of Projection Model and Analysis
  195 READ (NREAD,9,END=300) ISTATE,IX1,IX2,NK,NFORM,ICYEAR,LPRJ,IREG,
     1ITRANS,INOINT,NLANG
      NO = NK + NP
C
C     2. Read Commands for Special Features Invoked for the Run
      READ (NREAD,9) NOLOOP,ISINGL,IFEED,NOMOD,ICARDM,ICARDS
      IF (NOLOOP.EQ.0) NOLOOP = 1
C
C     3. Read Commands for Number and Sequence of Districts for Subtotals
C        NDIST = Number of subdivisions (districts) included
C        IDIST1 = Number of first district
C        IDIST2 = Number of second district
C        IDIST3 = Number of third district
C   Note: If total projections to be prorated are not divided by
C         district, enter 1 in the first field
      READ (NREAD,9) NDIST,(IDIST(I),I=1,10)
C
C     4. If Regesssion Used to Estimate Prorate Data, Read Y-Intercept
C        and B-Coefficients for X1 through Xn.
C       Omit this step if Y prorate data provided directly (IREG = 0)
C
      IF (IREG.EQ.1) READ (NREAD,511) ATRCEP,(BCOEF(I),I=1,NOLOOP)
C
C     5. If Used, Read Command Control for Override Data
C        NOEXCP = Number of periods for which override data provided
C        IEXCP  = Period identification for override years, starting
C                 with the first one.
C        Omit this step if Y prorate data provided directly (IREG = 0)
C
      IF (IREG.EQ.1) READ (NREAD,9) NOEXCP,(IEXCP(I),I=1,NOEXCP)
C
C     6. If Used, Read First Year Multiplier for Conversion Table
C
      IF (IFEED.NE.1) GOTO 510
      READ (NREAD,105) IFIRST,CONST
C
C     7. Read Remaining Year Conversion Factors, If Used
```

```
C        Insert 0 for IYEAR and 0.0 for VALUE if conversion is
C              constant through time.
C        Omit the step if conversion tables not to be made
C
      READ (NREAD,105) IYEAR,VALUE
      IF (IYEAR.EQ.0) GOTO 500
      DO 508 I = 3,NO
      IPOSI = IFIRST + I -1
  508 READ (NREAD,106) CONVRT(IPOSI)
  500 CONTINUE
C
C     8. If Used, Read Factors for Superimposing Transition
C
      IF (ITRANS.EQ.1) READ (NREAD,511) (FACTOR(I),I=1,10)
C
C     9. Read four title lines and six header lines for prorate tables
C
  510 READ (NREAD,96) IHEAD
C
C    10. If Used, Read four title lines for conversion tables
C
      IF (IFEED.EQ.1) READ (NREAD,96) PARHED
C
C    11. Read Footnotes for the Prorate Tables, four lines for two
C        footnotes of up to 130 characters and/or spaces each
C
      READ (NREAD,96) DOCOUN
C
C    II. READ COMMAND VALUES FROM THE SCREEN
C
  141 WRITE (0,48)
      WRITE (0,156)
  156 FORMAT (/' COMMAND VALUES TO BE SPECIFIED FOR THE PRORATIONS'//)
      WRITE (0,157)
  157 FORMAT (' Enter Code Number of Menu Selection and Key <return>.'//
     110X,'1  Type of Projection Model and Analysis'//10X,'2  Special Fe
     2atures Invoked for the Run'//10X,'3  Sequential Order for District
     3 Subtotals'//10X,'4  Intercept and Coefficients for Regression Est
     4imates'//10X,'5  Control Information for Override Data'//10X,'6  T
     5ransition Factors to Be Superimposed'//10X,              '7  Period
     6 by Period Multipliers for Conversion Table'//10X,'8  Titles and C
     7olumn Header Lines for Prorate Tables'//10X,'9  Footnote Lines for
     8 the Prorate Tables'//' SELECTION: ',I2/)
      READ (0,154) IVALUE
  154 FORMAT (I1)
      IF (IVALUE.EQ.0) GOTO 150
      GOTO (201,202,203,204,205,206,207,208,209),IVALUE
  201 WRITE (0,41)ISTATE,IX1,IX2,NK,NFORM,ICYEAR,LPRJ,IREG,ITRANS,INOINT
     1,NP
   41 FORMAT (' COMMANDS FOR TYPE OF PRORATION MODEL AND ANALYSIS:'//
     15X,' Enter two-digit value for each command in succession, with on
     2e blank'/6X,'space between entries.'//' 1 COLUMN NUMBER IN THE MAS
```

```
     3TER TABLE TO PRORATE:',I4,3X,'(Enter as 2-digit number)'/          ' 153
     4 2 FIRST EXPONENT ON THE TIME VARIABLE:',10X,I3,3X,'(Enter as abov 154
     5e)'/' 3 LAST EXPONENT ON TIME VARIABLE:    ',10X,I4,3X,'(Enter as  155
     6above)'//' 4 NUMBER OF PERIODS OF PRORATE DATA: ',10X,I4,3X,'(Ente 156
     7r as above)'/' 5 FORMULATE TRANSITION PATTERNS: ',    14X,I4,3X,'( 157
     8Yes = 01; No = 00)'/' 6 PERIOD OF FIRST DATA FOR PRORATION:',10X,I 158
     94,3X,'(Enter as 2-digit number)'/' 7 USE LOG MODEL FOR PRORATION:' 159
     A,17X,I4,3X,'(Yes = 01; No = 00)'//' 8 REGRESSION USED TO ESTIMATE  160
     BPRORATE DATA:',4X, I4,3X,'(Yes = 01; No = 00)'    /' 9 FIT MULTIPL 161
     CE TRANSITION PROJECTIONS:',9X,I4,3X,'(Yes = 01; No = 00)'/' 10 TOT 162
     DAL NUMBER OF COMPONENTS (COLUMNS) TO BE PRORATED TO THE'/4X,'VALUE 163
     ES IN THE MASTER TABLE IN THIS RUN:',5X,I4,'   (Enter as 2-digit nu 164
     Fmber)'/' 11 LANGUAGE CODE: ENG = 0, SPN = 1, FRN = 2',4X,I4,'   (E 165
     Gnter as 2-digit number)'//' SELECTIONS: '/)                        166
      READ (0,10) ISTATE,IX1,IX2,NK,NFORM,ICYEAR,LPRJ,IREG,ITRANS,INOINT 167
     1,NLANG                                                             168
   10 FORMAT (11(I2,1X))                                                 169
      IF (ICYEAR.GT.8) ICYEAR = ICYEAR + 1900                            170
      GOTO 141                                                           171
  202 WRITE (0,42) NOLOOP,ISINGL,IFEED,NOMOD,ICARDM,ICARDS               172
   42 FORMAT(////' COMMANDS FOR SPECIAL FEATURES INVOKED FOR THE RUN:'// 173
     1/5X,'Enter one-digit integer for each command in succession, with  174
     2one'/5X,'blank space between entries.'//' 1  NUMBER OF X VARIABLES 175
     3:',8X,I2,' (Enter 1 if Y Data Provided Directly)'/' 2  SINGLE YEAR 176
     4 OF PRORATE DATA:  ', I2,4X,'(Yes = 1, No = 0)'/' 3  MAKE CONVERSI 177
     5ON PRORATE TABLE:',I2,4X,'(Yes = 1, No = 0)'//' 4  OMIT PRINTING T 178
     6YPE OF PRORATE MODEL:',3X,I2,4X,'(Yes = 1, No = 0)'/' 5  CREATE FI 179
     7LE OF PRORATE OUTPUT TABLE:',3X,I2,4X,'(Yes = 1, No = 0)'/' 6  CRE 180
     8ATE FILE OF CONVERSION OUTPUT TABLE:',I2,4X,'(Yes = 1, No = 0)'/// 181
     9' SELECTIONS: '/)                                                  182
      READ (0,11) NOLOOP,ISINGL,IFEED,NOMOD,ICARDM,ICARDS                183
   11 FORMAT (6(I1,1X))                                                  184
      GOTO 141                                                           185
  203 WRITE(0,43) NDIST,(IDIST(I),I=1,10)                                186
   43 FORMAT (/' NUMBER AND SEQUENCE OF SUBAREAS (DISTRICTS):'///5X,'Ent 187
     1er two-digit number for each entry in succession, with one blank'/ 188
     29X,'space between entries.'//5X,'If projections to be prorated are 189
     3 are not divided by district, enter 01'/9X,'in the first field.'// 190
     4' 0  NUMBER OF SUBUNITS (DISTRICTS): ',I4,          /' 1  NUMBER  191
     5OF FIRST DISTRICT: ',I4/' 2  NUMBER OF SECOND DISTRICT:',I4/' 3  N 192
     6UMBER OF THIRD DISTRICT: ',I4/' 4  NUMBER OF FOURTH DISTRICT:',I4/ 193
     7' 5  NUMBER OF FIFTH DISTRICT: ',I4/' 6  NUMBER OF SIXTH DISTRICT: 194
     8 ',I4/' 7  NUMBER OF SEVENTH DISTRICT:',I3/' 8  NUMBER OF EIGHTH D 195
     9ISTRICT:',I4/' 9  NUMBER OF NINTH DISTRICT: ',I4/' 10 NUMBER OF TE 196
     ANTH DISTRICT: ',I4//' SELECTIONS: '/)                              197
      READ (0,10) NDIST,(IDIST(I),I=1,10)                                198
      GOTO 141                                                           199
  205 IF (IREG.EQ.1) GOTO 513                                            200
      WRITE (0,55)                                                       201
   55 FORMAT ('1',' REGRESSION ESTIMATES NOT USED, SO THAT OVERRIDE DATA 202
     1 NOT APPLICABLE'/)                                                 203
      PAUSE                                                              204
```

```
      GOTO 141
  513 WRITE (0,45) NOEXCP,(IEXCP(I),I=1,NOEXCP)
   45 FORMAT (/' NO. OF PERIODS OF OVERRIDE DATA, AND IDENTIFICATION FOR
     1 THESE PERIODS'/8X,'(Enter as two-digit numbers, with one space be
     2tween entries)'//' NUMBER OF PERIODS FOR WHICH OVERRIDE DATA PROVI
     3DED:',I4/' FIRST PERIOD OF OVERRIDE DATA:',21X,I4/' SECOND PERIOD
     4OF OVERRIDE DATA:',20X,I4/' THIRD PERIOD OF OVERRIDE DATA:',21X,I4
     5/' FOURTH PERIOD OF OVERRIDE DATA:',20X,I4/' FIFTH PERIOD OF OVERR
     6IDE DATA:',21X,I4/' SIXTH PERIOD OF OVERRIDE DATA:',21X,I4/' SEVEN
     7TH PERIOD OF OVERRIDE DATA:',19X,I4/' EIGHTH PERIOD OF OVERRIDE DA
     8TA:',20X,I4/' NINTH PERIOD OF OVERRIDE DATA:',21X,I4/' TENTH PERIO
     9D OF OVERRIDE DATA:',21X,I4//' SELECTIONS: '/)
      READ (0,10) NOEXCP,(IEXCP(I),I=1,NOEXCP)
      GOTO 141
  204 IF (IREG.EQ.1) GOTO 512
      WRITE (0,56)
   56 FORMAT ('1',' PRORATIONS BASED ON HISTORICAL COMPONENT DATA FOR TH
     1IS VARIABLE'/)
      PAUSE
      GOTO 141
  512 WRITE (0,46) ATRCEP,(BCOEF(I),I=1,NOLOOP)
   46 FORMAT(/' Y INTERCEPT AND B COEFFICIENTS FOR THE X VARIABLES:'///5
     1X,'(Enter 6-character decimal for each value, with one space' /5X,
     2'between them, and then <return>.'//' Y INTERCEPT:',F9.5/' B1 VALU
     3E:    ',F9.5/' B2 VALUE:    ',F9.5/' B3 VALUE:    ',F9.5/' B4 VALUE:
     4  ',F9.5/' B5 VALUE:    ',F9.5/' B6 VALUE:    ',F9.5/' B7 VALUE:    '
     5,F9.5/' B8 VALUE:    ',F9.5/' B9 VALUE:    ',F9.5/'B10 VALUE:  ',
     6F9.5//'SELECTIONS: '/)
      READ (0,511) ATRCEP,(BCOEF(I),I=1,NOLOOP)
      GOTO 141
  206 IF (ITRANS.EQ.1) GOTO 612
      WRITE (0,58)
   58 FORMAT ('1',' SUPERIMPOSED TRANSITION NOT USED IN THIS PROBLEM'/)
      PAUSE
      GOTO 141
  612 WRITE (0,460) (FACTOR(I),I=1,10)
  460 FORMAT ('1','  MULTIPLIER FACTORS FOR SUPERIMPOSED TRANSITION:'/'
     1(Enter 6-character decimal for each factor, with one'/' blank spac
     2e between them, and then <return>)'//10X, '1ST PERIOD:',F9.7/10X,'
     32ND PERIOD:',F9.7/10X,'3RD PERIOD:',F9.7//10X,'4TH PERIOD:',F9.7/
     410X,'5TH PERIOD:',F9.7/10X,'6TH PERIOD:',F9.7//10X,'7TH PERIOD:',
     5F9.7/10X,'8TH PERIOD:',F9.7/10X,'9TH PERIOD:'F9.7/9X,'10TH PERIOD:
     6',F9.7//' SELECTIONS:  '/)
      READ (0,511) (FACTOR(I),I=1,10)
      GOTO 141
  207 IF (IFEED.EQ.1) GOTO 514
      WRITE (0,57)
   57 FORMAT ('1',' CONVERSION TABLES NOT REQUESTED IN THIS PROBLEM'/)
      PAUSE
      GOTO 141
  514 WRITE (0,47) IFIRST,CONST,IYEAR,VALUE
   47 FORMAT (///' MULTIPLIERS FOR FIRST TWO PERIODS OF CONVERSION PRORA
```

```
     1TE TABLE:'//5X,'Enter the period as two-digit integer and multipli
     2er as 6-character'/5X,'decimal value, with one blank space between
     3 entries, and <return>.'///' FIRST PERIOD FOR APPLICATION OF CONVE
     4RSION FACTOR: ',I4//' MULTIPLIER FOR MAKING 1ST CONVERSION:',F8.3/
     5//' SECOND PERIOD FOR APPLICATION OF CONVERSION FACTOR:',I4//' MUL
     6TIPLIER FOR MAKING 2ND CONVERSION:',F8.3///' SELECTIONS: '/)
      READ (0,12) IFIRST,CONST,IYEAR,VALUE
   12 FORMAT (2(I2,1X,F7.3))
      IF (IYEAR.EQ.0) GOTO 306
      DO 305 I = 3,NO
      IPOSI = IFIRST+I-1
      WRITE (0,87) IPOSI,CONVRT(IPOSI)
   87 FORMAT ('1','THE DEFAULT MULTIPLIER FOR PERIOD ',I4,' IS ',F7.3//5
     1X,'Enter the correct value as a 6-character decimal number,'//5X,'
     2followed by <return>.'//' SELECTION: ')
  305 READ (0,13) CONVRT(IPOSI)
   13 FORMAT (F7.3)
  306 GOTO 141
C
C   III.  READ TITLE, HEADERS AND FOOTNOTES FOR OUTPUT TABLES
C
  208 WRITE (0,18) IHEAD
   18 FORMAT (///' TITLE AND HEADER LINES FOR MAIN PRORATE TABLE:'//5X,'
     1Enter ten 80-column lines with <return> at the end of each one.'//
     25X,'To bypass typing prorate table titles and headers and accept t
     3he default'/5X,'ones instead, type 1 for Bypass and <return>; othe
     4rwise type 0 and'/5x,'<return> or just <return> and proceed to typ
     5e title lines.'//10(1X,20A4)//' SELECTIONS: '/)
      READ (0,152) IPASS
  152 FORMAT (I1)
      IF (IPASS.EQ.1) GOTO 141
      READ (0,96) IHEAD
      IF (IFEED.EQ.0) GOTO 141
      WRITE (0,88) PARHED
   88 FORMAT (////' TITLE LINES FOR PRORATE CONVERSION TABLES:'//5X,'Ent
     1er four 80-column lines with <return> at the end of each line.'//
     24(1X,20A4)//' SELECTIONS: '/)
      READ (0,96) PARHED
      GOTO 141
  209 WRITE (0,49) DOCOUN
   49 FORMAT(/' FOOTNOTE LINES FOR THE PRORATE TABLES'//5X,'Enter four 1
     lines (for two footnotes of up to 132 characters)'/5X,'with <return
     2> at the end of each line.'//5X,'To bypass typing the footnote lin
     3es and accept the default ones'/ 5X,'instead, type 1 (for bypass)
     4and <return>; otherwise type 0 and <return>'/ 5X,'or just <return>
     5 and proceed to type footnote lines.'//4(1X,20A4)//' SELECTIONS:')
      READ (0,152) IPASS
      IF (IPASS.EQ.1) GOTO 141
      READ (0,96) DOCOUN
      GOTO 141
  150 CONTINUE
C
```

```
      IV.  CREATE THE COMMAND FILE, INPUT.PPJ, FOR THE RUN
C
      OPEN (2,FILE='INPUT.PPJ',STATUS='NEW')
      WRITE (NFILE,9)ISTATE,IX1,IX2,NK,NFORM,ICYEAR,LPRJ,IREG,ITRANS,
     1INOINT,NLANG
      WRITE (NFILE,9) NOLOOP,ISINGL,IFEED,NOMOD,ICARDM,ICARDS
      WRITE (NFILE,9) NDIST,(IDIST(I),I=1,10)
      IF (IREG.EQ.1) WRITE (NFILE,511)ATRCEP,(BCOEF(I),I=1,NOLOOP)
      IF (IREG.EQ.1) WRITE (NFILE,9) NOEXCP,(IEXCP(I),I=1,NOEXCP)
      IF (ITRANS.EQ.1) WRITE (NFILE,511) (FACTOR(I),I=1,10)
      IF (IFEED.EQ.0) GOTO 219
      WRITE (NFILE,105) IFIRST,CONST
      WRITE (NFILE,105) IYEAR,VALUE
      IF (IYEAR.EQ.0) GOTO 219
      DO 220 I = 3,NO
      IPOSI = IFIRST + I - 1
  220 WRITE (NFILE,105) IPOSI,CONVRT(IPOSI)
  219 WRITE (NFILE,96) IHEAD
      IF (IFEED.EQ.1) WRITE (NFILE,96) PARHED
      WRITE (NFILE,96) DOCOUN
  200 CONTINUE
      WRITE (0,92)
   92 FORMAT(//' PROGRAM WILL NOW READ THE HISTORICAL DATA AND MAKE THE
     1PRORATIONS'//5X,'The data input is read from the disk file, PPJDAT
     2A.RUN, in the format'   /5X,'I3, 1X, A4, 8F9.0.  Each data set is
     3preceded by the INUMC and INOIND'/5X,'information and four lines o
     4f headers for that page of output.'//5X,'If override data are prov
     5ided, they are included with the X1 input  '/5X,'data, and are in
     6the same format.'//5X,'Information should be included for all INOI
     7NT columns to be included'/5X,'in the proration as indicated at St
     8ep 2.'//5X,'To proceed, be sure the file just made with PRORATE1,
     9Input.PPJ,'   /5X, 'is on the same disk with PRORATPJ.EXE and your
     A OUTPUT.MPJ and '/5X,'PPJDATA.RUN files, and then simply type PROR
     BATPJ and <return>.'//5X,'Key <return> to go on.'/)
      PAUSE
      WRITE (0,48)
  300 CONTINUE
  190 WRITE (0,40)
   40 FORMAT (' Commands and Headers Now Stored in the INPUT.PPJ File;
     1'/' Proceed to the PRORATPJ Run'/)
      STOP
      END
```

APPENDIX B

LISTING OF THE PRORATPJ SOURCE PROGRAM

```
C
C      PRORATION PROJECTION PROGRAM WITH MULTIPLE OPTIONS
C
C                 PROFESSOR RICHARD PHILLIPS
C            DEPARTMENT OF AGRICULTURAL ECONOMICS
C                  KANSAS STATE UNIVERSITY
C
      REAL MATRIX,MATRIN
      DIMENSION MATRIX(3600),MATRIN(3600),STATPJ(3600)
      COMMON/AREA 1/IANN,ICARDM,ICARDS,ICUE,ICYEAR,IDONE,IFEED,IFIRST,
     1IK1,IMON,INOUT,IPOSI,IQTR,ISTATE,ISINGL,IYEAR,IREG,IX1,IX2,ITRANS,
     2JMON,JQTR,KRATE,LPRJ,MPER,LIM,ND,NFILE,NFIT,NK,NLANG,NMON,NRUNS,
     3NOEXCP,NOLOOP,NOMOD,NP,NPRINT,NPUNCH,NQTR,NREAD,NT,NYR,IPEROD(180)
      DATA NCARD/1/
    3 FORMAT (20I4)
      OPEN (1,FILE='OUTPUT.MPJ',STATUS='OLD')
C
C      I. READ BASIC PARAMETERS FOR THE PROBLEM FROM THE OUTPUT.MPJ FILE
C            Read problem size and logical unit device numbers from file
C                          FORMAT IS 20 I 4
C
    1 READ (NCARD,3,END=99) IROW,ICOL,NREAD,NPUNCH,NPRINT,NDISK,NFILE
      WRITE (0,48)
   48 FORMAT (20(/))
      WRITE (0,151)
  151 FORMAT (/17X, 'PRORATION PROJECTION PROGRAM WITH USER OPTIONS'
     1 /26X,'Professor Richard Phillips'/21X,'Department of Agricultural
     2 Economics'/27X,'Kansas State University'//5X,'* This program read
     3s master table information from the OUTPUT.MPJ file,'/7X,  'comman
     4d information from the INPUT.PPJ file and historical proration '
     5/7X,'data for n periods from the users disk file PPJDATA.RUN (prep
     6ared'/7X,'in LOTUS 123 print file format).'//5X,'* The program fit
     7s mathematical time trends with specified model'/7X,'and prorates
     8the components to the master projection.'//5X,'* Command options c
     9an be changed by keyboard input and saving'/7X,'the changes using
     Athe companion PRORATE1 program to modify the'/7X,  'INPUT.PPJ file
     B.'//5X,'* The various prorate options under the program are contro
     Clled by keyboard'/7X,'commands supplied by the user with PRORATE1
     Din response to Menu prompts.'//10X,'Number of columns in the Maste
     Er Table to be prorated in this run:'/15X,'(Enter one-digit integer
     F, e.g., 3, and <return>)'///' SELECTION: '/)
      READ (0,5) NRUNS
    5 FORMAT (I1)
      IF (NRUNS.EQ.0) NRUNS = 1
    2 CALL PPJ (IROW,ICOL,MATRIX,MATRIN,STATPJ)
   99 STOP
      END
```

```
      SUBROUTINE PPJ (IROW,ICOL,MATRIX,MATRIN,STATPJ)
      REAL MATRIX,MATRIN
      DIMENSION MATRIX(IROW,ICOL),MATRIN(IROW,ICOL),STATPJ(IROW,ICOL)
      DIMENSION RESBAL(40),DOCSTA(80),ISEQ(180)
      DIMENSION IOUTLI(10),INSET(10),VECTIN(20),LOTVEC(180),LONVEC(180)
      DIMENSION KOTVEC(180),KONVEC(180),ICRDNO(20),IPRT(180),JPRT(180)
      DIMENSION STATPR(180),ITOTNO(180),STAT(5,72)
      COMMON/AREA 1/IANN,ICARDM,ICARDS,ICUE,ICYEAR,IDONE,IFEED,IFIRST,
     1IK1,IMON,INOUT,IPOSI,IQTR,ISTATE,ISINGL,IYEAR,IREG,IX1,IX2,ITRANS,
     2JMON,JQTR,KRATE,LPRJ,MPER,LIM,ND,NFILE,NFIT,NK,NLANG,NMON,NRUNS,
     3NOEXCP,NOLOOP,NOMOD,NP,NPRINT,NPUNCH,NQTR,NREAD,NT,NYR,IPEROD(180)
      COMMON/AREA 2/NU,A,B,RSQ,SB,SYX,YBAR,X(180),Y(180)
      COMMON/AREA 3/ATRCEP,CONST,INOINT,NDIST,NFORM,W,WRATE,BCOEF(10),
     1IDIST(10),IEXCP(10),CONHED(80),DOCOUN(80),PARHED(80),CONVRT(180),
     2FACTOR(180),IYRPR(180),JPEROD(180),IHEAD(200),IPWH(800),JPWH(800)
    3 FORMAT (20I4)
    4 FORMAT (' ',132('_'))
    5 FORMAT ('/')
    6 FORMAT (13X,I4,5X,I4)
   19 FORMAT (' ',6X,'rsq',12F10.5)
   24 FORMAT (' ',33A4)
   75 FORMAT ('1',' NORMAL END OF THE PRORATION PROJECTION PROGRAM')
   76 FORMAT ('1', ' FIN NORMALE DU PROGRAMME')
   77 FORMAT (' ',I4,1X,I4,12I10)
   78 FORMAT (I4,1X,I4,12F9.0)
   96 FORMAT (20A4)
   98 FORMAT (8X,8F9.0/8X,4F9.0)
   99 FORMAT (8X,8F9.0)
  111 FORMAT ('1',' TERMINACION NORMAL DEL PROGRAMA')
  504 FORMAT (1H1,'THE FIRST PERIOD OF PRORATE DATA IS PRIOR TO THE FIRS
     1T PERIOD OF MASTER DATA.')
  506 FORMAT (1H1,' LA PREMIERE PERIODE DE LA DONNEES PRORATE COMMENCE A
     1VANT A LA PREMIERE PERIODE DE LA DONNEES PRINCIPAUX.')
  512 FORMAT (8X,8(5X,I4)/4X,I4,8(5X,I4))
  902 FORMAT (' ','SOURCE:')
 1203 FORMAT (1H1,'  EL PRIMER AO DEL INPUT PARA PARTE DE LA DATA ESTA
     1ANTES DEL PRIMER AO DE TODA LA DATA.')
 1204 FORMAT (' ','FUENTE:')
 1217 FORMAT (' ',5X,'Ybar',12F10.5)
 1220 FORMAT (' ',6X,'Syz',12F10.5)
 1221 FORMAT (' ',7X,'sb',12F10.5)
 1317 FORMAT (' ',1X,'Log Ybar',12F10.5)
 1318 FORMAT (' ',5X,'b(%)',12F10.5)
      NDATA = 1
      ICONCU = 0
      NREAD = 2
      LTRIP = 0
      ICHECK = 0
C
C       II.  READ CONTROL FILES CREATED BY MASTER PROJECTION RUN
C
C            Read Control Commands for Master Table from Disk File
```

```
C                    Set JCOUTY at 2 for transition conversion table
C                              FORMAT is 4X, 19I4
C
   89 READ (NFILE,3,END=535) NI,NU,IX1,IX2,NP,NC,NCS,IYIN,NFAC,LPRJ,
     1NO[illegible],IFORM,NOPRT,KRATE,KARDM,KARDT,NOMOD,JCOUTY,JEST
      IF (NFAC.EQ.0) NFAC=1
      IDOT = 1
C
C           Read the Number of Data Sets Needed for each Period, and
C           the number of fields of input data (no extra for period)
C           in each set (Maximum total number of fields = 72).
C                         FORMAT is 4X, 19 I 4
C
      READ (NFILE,3) NCS,(INSET(I),I=1,NCS)
C
C           Read number of pages required for the main output table, and
C           number of fields of data (no extra for year) on each page.
C                              FORMAT is 4X, 19 I 4
C
      READ (NFILE,3) INO,(IOUTLI(I),I=1,INO)
   44 CONTINUE
      INO2 = INO * 2
      ISINGL = 0
C
C  III. READ MASTER TABLE TITLE AND FOOTNOTE FILES
C
C           Read title lines for master tables (10 lines)
C                                 FORMAT is 20 A 4
C
      READ (NFILE,96) IHEAD
C
C           Read field (column) header lines for master tables (4 lines
C           needed to make two line decked headers in printed output):
C                                   FORMAT is A5, 4X, 12 A 10
C
      DO 405 I = 1,INO2
      IN3 = (I-1)*40+1
      IN4 = IN3 + 39
      READ (NFILE,96) (IPWH(L),L=IN3,IN4)
  405 CONTINUE
C
C           Read data source footnotes (4 lines), providing two 132
C           column lines of printed footnotes:
C                                 FORMAT is 20 A 4 / 13 A 4
C
  420 READ (NFILE,96) DOCSTA
      IF (NC.EQ.0) NC=10
      IX1 = IX1 + 1
      IX2 = IX2 + 1
      NT = NC - 2
      NJ = NI
      NK = NI
```

```
      ND = NI-NU+1
      NE = NI-NU
      LIM = NI+NP
      LIMO = LIM + IDIF
      NPRO = NI+1
      JIN = 0
      NC2 = NC-1
      DO 42 I=1,LIM
      DO 42 J=1,NC2
   42 MATRIX(I,J) = 0.0
      DO 65 MP = 1,INO
      JIM = JIN+1
      JIN = JIN+IOUTLI(MP)
      DO 211 I = 1,LIM
C
C   IV. READ MASTER PROJECTION TABLES FROM OUTPUT.MPJ FILE
C
C           Read Master Table data file, assembled as follows:
C           Data set No. 1, All periods
C           ...  ...  ...
C           Data set No. n, All periods
C                   FORMAT is I4, 1X, I4, 12 F 9.0
C
      READ (NFILE,78) ISEQ(I),IPEROD(I),(STATPJ(I,J),J=JIM,JIN)
  211 CONTINUE
   65 CONTINUE
      OPEN (2,FILE='INPUT.PPJ',STATUS='OLD')
C
C   V. READ CONTROL COMMANDS FOR PRORATE SUBTABLES
C
C         See Prorate Subroutine for data input here
C
  217 IF (LTRIP.GE.NRUNS) GOTO 535
      ITOT = 0
      LTOT = 0
      ICUE = 1
      IPRINT = 0
      LAP = 0
      CALL PRORATE
      IF (ISTATE.EQ.0) GOTO 535
      DO 43 I = 1,NO
      LOTVEC(I) = 0
   43 LONVEC(I) = 0
      NU = NK
      NI = NK
      ICONCU = IFEED
      KRATE = 0
      ICHANG = NJ - NK
      IF (ICHANG) 191,192,193
  191 IF (NLANG.EQ.0) WRITE (NPRINT,504)
      IF (NLANG.EQ.1) WRITE (NPRINT,1203)
      IF (NLANG.EQ.2) WRITE (NPRINT,506)
```

```
      GOTO 505
  193 LIM2 = LIM-ICHANG
      NP = LIM2-NK
      ND = 1
      NE = 0
      NO = NK+NP
      NPRO = NK+1
      LOOPER = LIM2
      DO 401 I=1,LOOPER
      IPARM = I+ICHANG
      IYRPR(I) = ISEQ(IPARM)
      JPEROD(I) = IPEROD(IPARM)
  401 STATPR(I) = STATPJ(IPARM,ISTATE)
      GOTO 570
  192 NO = LIM
      NP = NO-NI
      ND = 1
      NE = 0
      NPRO = NI+1
      DO 569 J1 = 1,LIM
      IYRPR(J1) = ISEQ(J1)
      JPEROD(J1) = IPEROD(J1)
  569 STATPR(J1) = STATPJ(J1,ISTATE)
  570 IF (LTRIP.EQ.0) OPEN (1,FILE='PPJDATA.RUN',STATUS='OLD')
      IDONE = 0
      ICOUTY = 0
      ISUMNO = 0
      INOCON = 0
      ICOUNT = 0
      JCOUNT = 0
C
C       11. Read number of counties in table and CRD (Crop Reporting
C           District) Total
C           This step and Steps 12 - 14 must be repeated for
C           each page of prorate table output.
C                   FORMAT is 13X, I4, 5X, I4
C
  221 READ (NDATA,6,END=217) INUMC,INOIND
      ICOUNT = ICOUNT + INUMC
      INUMIN = INUMC
      NUMC = INUMC
      ICOUTY = ICOUTY+1
      ICRDNO(ICOUTY) = INUMC
      JCOUNT = JCOUNT + INUMC
      IF (INOIND.GT.NUMC.AND.JCOUNT.LT.INOIND) GOTO 218
      ISUMNO = ISUMNO+1
      ITOTNO(ISUMNO) = INOIND
C
C       12. Read field headers for this page of prorate table output
C           (Four lines for two-line decked headers in fields of I9,
C           12 I 10, starting with 'Year' and going to 'Total'
C
```

```
  218 IF (JCOUNT.EQ.INOIND) JCOUNT = 0
      JN3 = (ICOUTY-1)*80+1
      JN4 = JN3 + 79
      READ (NDATA,96) (JPWH(I),I=JN3,JN4)
      INUMC = INUMC+INOCON
      INOCON = INOCON+1
      IF (IREG.EQ.1) GOTO 515
      IF (NFORM.EQ.1) GOTO 514
      IF (ISINGL.EQ.1) GOTO 906
C
C    VI.  READ SUBTABLE PRORATE DATA
C
C       13. Read subtable input data
C                   FORMAT is 8X, 8F9.0  or 8X, 8F9.0 / 8X, 4F9.0
C
      DO 219 I=1,NI
      IF(NUMC.GT.8) READ (NDATA,98) (MATRIX(I,J),J=INOCON,INUMC)
  219 IF(NUMC.LE.8) READ (NDATA,99) (MATRIX(I,J),J=INOCON,INUMC)
      GOTO 530
  906 IF(NUMC.LE.8) READ (NDATA,99)(MATRIX(I,J),J=INOCON,INUMC)
      IF(NUMC.GT.8) READ (NDATA,98)(MATRIX(I,J),J=INOCON,INUMC)
      GOTO 530
  515 IF (NOEXCP.EQ.0) NOEXCP = 1
      DO 516 I=1,NOLOOP
      DO 516 I1 = 1,NI
      IYER = ICYEAR+I1-1
      DO 517 I2 = 1,NOEXCP
      IF (IYER.EQ.IEXCP(I2)) GOTO 525
  517 CONTINUE
C
C       14. If provided, read county override data
C               Omit this step if no override data provided
C             FORMAT is 8X, 8F9.0 / 8X, 4F9.0
C
      IF(NUMC.GT.8) READ (NDATA,98)(VECTIN(I5),I5=1,INUMIN)
      IF(NUMC.LE.8) READ (NDATA,99) (VECTIN(I5),I5=1,INUMIN)
      DO 518 I3 = 1,INUMIN
      IPARM2 = INOCON+I3-1
      MATRIX(I1,IPARM2) = MATRIX(I1,IPARM2)+BCOEF(I)*VECTIN(I3)
  518 CONTINUE
      IF (I.GT.1) GOTO 516
      DO 519 I3=INOCON,INUMC
  519 MATRIX(I1,I3) = MATRIX(I1,I3)+ATRCEP
      GOTO 516
  525 IF(NUMC.LE.8) READ (NDATA,99) (VECTIN(I6),I6=1,INUMIN)
      IF(NUMC.GT.8) READ (NDATA,98) (VECTIN(I6),I6=1,INUMIN)
      IF (I.GT.1) GOTO 516
      DO 526 I2 = 1,INUMIN
      IPARM3 = INOCON+I2-1
  526 MATRIX(I1,IPARM3) = VECTIN(I2)
  516 CONTINUE
      GOTO 530
```

```
  514 DO 513 I=1,NOLOOP
      IF(NUMC.GT.8) READ (NDATA,98)(MATRIX(I,J),J=INOCON,INUMC)
  513 IF(NUMC.LE.8) READ (NDATA,99) (MATRIX(I,J),J=INOCON,INUMC)
  530 INOCON = INUMC
      IF (ICOUNT.GE.INOINT) LTRIP = LTRIP + 1
      IF (ICOUNT.GE.INOINT) GOTO 225
      GOTO 221
C
C    VII. COMPUTE HISTORICAL DATA FOR PRORATE TABLES
C
  225 IF (ISINGL.NE.1) GOTO 908
      IF (NFORM.EQ.1) GOTO 633
      DEVIDE = 0.0
      DO 909 K1 = 1,INOCON
  909 DEVIDE = DEVIDE+MATRIX(1,K1)
      IF (DEVIDE.EQ.0.) GOTO 911
      DO 910 K2=1,INOCON
      MATRIX(1,K2) = (MATRIX(1,K2)/DEVIDE)
      DO 910 K3=2,NO
  910 MATRIX(K3,K2) = MATRIX(1,K2)
      GOTO 911
  633 I4 = 0
      DO 636 I1 = 1,NO
      I4 = I4+1
      IF (I4.GT.NOLOOP) GOTO 638
      DEVIDE = 0.0
      DO 637 I2 = 1,INOCON
  637 DEVIDE = DEVIDE+MATRIX(I1,I2)
      IF (DEVIDE.EQ.0.0) GOTO 636
  638 DO 639 I3 = 1,INOCON
      IF (I4.LE.NOLOOP) MATRIX(I1,I3) = MATRIX(I1,I3)/DEVIDE
      IF (I4.GT.NOLOOP) MATRIX(I1,I3) = MATRIX(I1-1,I3)
  639 CONTINUE
  636 CONTINUE
      GOTO 911
  908 DO 215 I = 1,NI
      DEVIDE = 0.0
      DO 214 I1 = 1,INOCON
  214 DEVIDE = DEVIDE + MATRIX(I,I1)
      IF (DEVIDE.EQ.0.) GOTO 215
      DO 213 I2 = 1,INOCON
  213 MATRIX(I,I2) = MATRIX(I,I2)/DEVIDE
  215 CONTINUE
  911 NT = INOCON
      LK = 0
  216 DO 60 KK=IX1,IX2,2
      LK = LK+1
      INOUT = 0
      JIN = 0
 2117 W = 1.+FLOAT(KK-1)/10.
      IF (ISINGL.EQ.1) GOTO 912
      IDONE = 0
```

```
C
C   VIII. FIT THE PRORATION PROJECTIONS
C
   34 DO 9 I=1,NT
      DO 10 J=ND,NI
      IF (LPRJ.EQ.0.AND.MATRIX(J,I).EQ.0.) MATRIX(J,I)=.00001
      IF (LPRJ.EQ.1.AND.MATRIX(J,I).EQ.0.) MATRIX(J,I)=.00005
      Y(J-NE) = MATRIX(J,I)
      IF (LPRJ.EQ.1) Y(J-NE) = ALOG(Y(J-NE))
      IF (LPRJ.EQ.1) X(J-NE) = J-NE
   10 IF (LPRJ.EQ.0) X(J-NE) = FLOAT(J-NE)**W
      CALL REG
      STAT(1,I) = YBAR
      STAT(2,I) = B
      STAT(3,I) = RSQ
      STAT(4,I) = SYX
      STAT(5,I) = SB
      IF (LPRJ.EQ.1) GOTO 620
      DO 364 J = ND,NO
  364 Y(J) = A+B*FLOAT(J)**W
      GOTO 621
  620 DO 365 J = ND,NO
  365 Y(J) = A+B*FLOAT(J)
  621 CONTINUE
  336 IF (NP.EQ.0) GOTO 12
      LL = NI+1
      JJ = NI+NP
      DO 11 J=LL,JJ
      IF (LPRJ.EQ.0) MATRIX(J,I) = Y(J)
      IF (LPRJ.EQ.1) MATRIX(J,I) = EXP(Y(J))
   11 CONTINUE
   12 CONTINUE
    9 CONTINUE
  130 IF (ICUE.EQ.1) GOTO 233
C
C   IX. IMPOSE XERO LOWER LIMITS (UNLESS NEGNO = 1 OR NP = 0)
C
  407 DO 404 I = 1,NO
      DO 404 J = 1,NT
  404 MATRIN(I,J) = 0.0
  232 DO 2319 J = 1,NT
      IPRT(J) = 0
 2319 JPRT(J) = 0
      IF (IDONE.EQ.1) GOTO 113
      IF (NP.EQ.0.OR.NEGNO.EQ.1) GOTO 113
      DO 112 I = 1,NO
      DO 112 J = 1,NT
      IF (MATRIX(I,J).LT.0.) MATRIX(I,J) = 0.0
  112 CONTINUE
  113 CONTINUE
C
C   X. FIT THE SUPERIMPOSED TRANSITION, IF REQUESTED
```

```
C
      IF (IDONE.EQ.0.OR.NFORM.NE.1) GOTO 27
      DO 23 I = 1,NO
      DO 23 J = 1,NT
      I4 = 0
      DO 25 I2 = I,NO
      I4 = I4 + 1
   25 MATRIN(I2,J) = MATRIN(I2,J)+STATPJ(I,J)*CONVRT(I4)
   23 CONTINUE
   27 CONTINUE
      IF (IDONE.EQ.1.OR.ITRANS.EQ.0.AND.ICONCU.EQ.9) GOTO 224
      IDONE = 1
      GOTO 232
  224 IDONE = 0
      INOUT = INOUT+1
      IK1 = 0
      IF (ICUE.EQ.1) GOTO 920
      IF (IDONE.EQ.1) GOTO 201
      JIM = JIN+1
      JIN = JIN+IOUTLI(INOUT)
  201 CONTINUE
C
C   XI. PRINT HEADINGS FOR MAIN AND CONVERSION TABLES
C
   35 IF (IDONE.EQ.0.AND.NOPRT.EQ.1) GOTO 409
      IF (ICUE.EQ.1.AND.IPRINT.GE.INOCON) GOTO 60
   36 IF (IDONE.EQ.0) LAP = LAP + 1
      CALL TABLES (LAP,LONVEC,LOTVEC)
      DO 28 J = JIM,JIN
      IPRT(J) = 0
   28 JPRT(J) = 0
      IF (ICHECK.EQ.1.OR.ICARDM.EQ.0.AND.ICARDS.EQ.0) GOTO 61
      OPEN (1,FILE='OUTPUT.PPJ',STATUS='NEW')
      ICHECK = 1
   61 CONTINUE
      DO 13 I = 1,NO
      ISUM = 0
      DO 234 J = JIM,JIN
      IF (IDONE.EQ.1) GOTO 342
      IF (MATRIX(I,J).GE.0.0) IPRT(J) = MATRIX(I,J)+.5
      IF (MATRIX(I,J).LT.0.0) IPRT(J) = MATRIX(I,J)-.5
      ISUM = ISUM+IPRT(J)
      IF (J.EQ.JIN) ITOT = ISUM
      GOTO 234
  342 IF (ITRANS.NE.1) GOTO 235
      JPRT(J) = 0
      DO 170 K = 1,I
      II = I-K+1
      IF (MATRIX(II,J).GE.0.0) JPRT(J) = JPRT(J) + (MATRIX(I,J) *
     1FACTOR(I-II+1) + .5
      IF (MATRIX(II,J).GE.0.0) JPRT(J) = JPRT(J) + (MATRIX(I,J) *
     1FACTOR(I-II+1) - .5
```

```
  170 CONTINUE
      GOTO 181
  235 IF (MATRIX(I,J).GE.0.0) JPRT(J) = (MATRIX(I,J)*CONVRT(I))+.5
      IF (MATRIX(I,J).LT.0.0) JPRT(J) = (MATRIX(I,J)*CONVRT(I))-.5
  181 ISUM = ISUM+JPRT(J)
      IF (J.EQ.JIN) LTOT = ISUM
  234 CONTINUE
C
C  XII. PRINT THE MAIN (AND CONVERSION) PRORATE TABLES
C
      IF (IDONE.EQ.0) KOTVEC(I) = KOTVEC(I)+ISUM
      IF (IDONE.EQ.0) LOTVEC(I) = LOTVEC(I)+ITOT
      IF (IDONE.EQ.1) KONVEC(I) = KONVEC(I)+ISUM
      IF (IDONE.EQ.1) LONVEC(I) = LONVEC(I)+LTOT
      IZ1 = IYRPR(I)
      IZ2 = JPEROD(I)
      IF (IDONE.EQ.0.AND.ICARDM.EQ.1) WRITE (NPUNCH,77) IZ1,IZ2,
     1(IPRT(K),K=JIM,JIN)
      IF (IDONE.EQ.1.AND.ICARDS.EQ.1) WRITE (NPUNCH,77) IZ1,IZ2,
     1(JPRT(K),K=JIM,JIN)
      IF (ILISUM.NE.ISUMS) GOTO 253
      IF (IDONE.EQ.0.AND.NDIST.LE.1.OR.JIN.LT.INOINT) WRITE (NPRINT,
     177) IZ1,IZ2,(IPRT(K),K=JIM,JIN),KOTVEC(I)
      IF (IDONE.EQ.0.AND.NDIST.GT.1.AND.JIN.GE.INOINT) WRITE (NPRINT,
     177) IZ1,IZ2,(IPRT(K),K=JIM,JIN),KOTVEC(I),LOTVEC(I)
      IF (IDONE.EQ.1.AND.NDIST.LE.1.OR.JIN.LT.INOINT) WRITE (NPRINT,
     177) IZ1,IZ2,(JPRT(K),K=JIM,JIN),KONVEC(I)
      IF (IDONE.EQ.1.AND.NDIST.GT.1.AND.JIN.GE.INOINT) WRITE (NPRINT,
     177) IZ1,IZ2,(JPRT(K),K=JIM,JIN),KONVEC(I),LONVEC(I)
      GOTO 20
  253 IF (IDONE.EQ.0) WRITE (NPRINT,77) IZ1,IZ2,(IPRT(K),K=JIM,JIN)
      IF (IDONE.EQ.1) WRITE (NPRINT,77) IZ1,IZ2,(JPRT(K),K=JIM,JIN)
   20 IF (I.EQ.I/5*5) WRITE (NPRINT,5)
   13 CONTINUE
  160 IF (IDONE.EQ.1) GOTO 161
      IF (ISINGL.EQ.1) GOTO 161
      WRITE (NPRINT,4)
      IF (LPRJ.EQ.0) WRITE (NPRINT,1217) (STAT(1,J),J=JIM,JIN)
      IF (LPRJ.EQ.1) WRITE (NPRINT,1317) (STAT(1,J),J=JIM,JIN)
      WRITE (NPRINT,1318) (STAT(2,J),J=JIM,JIN)
      WRITE (NPRINT,19) (STAT(3,J),J=JIM,JIN)
      WRITE (NPRINT,1220) (STAT(4,J),J=JIM,JIN)
      WRITE (NPRINT,1221) (STAT(5,J),J=JIM,JIN)
  161 WRITE (NPRINT,4)
      IF (NLANG.EQ.0.OR.NLANG.EQ.2) WRITE (NPRINT,902)
      IF (NLANG.EQ.1) WRITE (NPRINT,1204)
      WRITE (NPRINT,24)(DOCOUN(I),I=1,33)
      WRITE (NPRINT,24)(DOCOUN(I),I=41,73)
  409 CONTINUE
      IF (ICUE.EQ.1) GOTO 915
      IF (ICONCU.EQ.0.AND.ITRANS.EQ.0) GOTO 410
      IF (IDONE.EQ.1) GOTO 410
```

```
      IDONE = 1
      GOTO 35
  410 CONTINUE
      IF (INOUT.EQ.INO) GOTO 60
      IDONE = 0
      GOTO 224
C
C   XIII. FORCE SUBTABLE PROJECTIONS TO MASTER TABLE TOTALS
C
  233 ICONCU = IFEED
      IDONE = 0
      IF (NPRO.GT.NO) GOTO 899
      DO 236 I = NPRO,NO
      DEVID = 0.0
      DO 237 I1 = 1,INOCON
      IF (MATRIX(I,I1).LT.0.0) MATRIX(I,I1) = 0.(
  237 DEVID = DEVID+MATRIX(I,I1)
      IF (DEVID.EQ.0.) GOTO 236
      DO 238 I1 = 1,INOCON
  238 MATRIX(I,I1) = (MATRIX(I,I1)/DEVID)*STATPR(I)*10.0
  236 CONTINUE
  899 DO 239 I = 1,NI
      DO 239 I1 = 1,INOCON
      IF (MATRIX(I,I1).GT.1.5) GOTO 239
      MATRIX(I,I1) = MATRIX(I,I1)*STATPR(I)*10.0
  239 CONTINUE
      GOTO 916
  912 DO 913 I = 1,NO
      DO 913 I1 = 1,INOCON
      IF (MATRIX(I,I1).GT.1.5) GOTO 913
      MATRIX(I,I1) = MATRIX(I,I1)*STATPR(I)*10.0
  913 CONTINUE
  916 NC = INOCON+2
      KARDM = ICARDM
      KARDT = ICARDS
      GOTO 232
  920 IPRINT = 0
      IK = 0
  240 IK = IK+1
      DO 246 I = 1,NO
      KOTVEC(I) = 0
  246 KONVEC(I) = 0
      ISUMS = ITOTNO(IK)
      ILISUM = 0
  241 IK1 = IK1+1
      ILINE = ICRDNO(IK1)
      ILISUM = ILISUM + ILINE
      IPR2 = IPRINT + ILINE
      IPRINT = IPRINT + 1
      IDONE = 0
      JIM = IPRINT
      JIN = IPR2
```

```
      ICUE = 1
      GOTO 35
  243 IDONE = 1
      GOTO 35
  915 IF (ICONCU.EQ.0.AND.ITRANS.EQ.0) GOTO 280
      IF (IDONE.EQ.1) GOTO 280
      GOTO 243
  280 IPRINT = IPR2
      IF (IPRINT.GE.INOCON) GOTO 60
      IF (ILISUM.EQ.ISUMS) GOTO 240
      GOTO 241
   60 CONTINUE
      GOTO 217
  535 IF (NLANG.EQ.0) WRITE (NPRINT,75)
      IF (NLANG.EQ.1) WRITE (NPRINT,111)
      IF (NLANG.EQ.2) WRITE (NPRINT,76)
  505 CONTINUE
      RETURN
      END
C
      SUBROUTINE REG
C
      COMMON/AREA 2/NU,A,B,RSQ,SB,SYX,YBAR,X(180),Y(180)
      DOUBLE PRECISION C,D,E,G,SSYX
      SUMXY = 0.
      SUMY = 0.
      SUMX = 0.
      SUMXX = 0.
      SUMYY = 0.
      N = NU
      DO 1 I=1,N
      SUMXY = SUMXY+X(I)*Y(I)
      SUMY = SUMY+Y(I)
      SUMX = SUMX+X(I)
      SUMXX = SUMXX+X(I)*X(I)
    1 SUMYY = SUMYY+Y(I)*Y(I)
      IF (N.EQ.0) GOTO 2
      T = FLOAT(N)
      XBAR = SUMX/T
      YBAR = SUMY/T
      GOTO 3
    2 XBAR = 0.
      YBAR = 0.
    3 C = SUMXY-SUMY*XBAR
      D = SUMXX-SUMX*XBAR
      IF (D.EQ.0.) GOTO 4
      B = C/D
      A = YBAR-B*XBAR
      E = SUMYY-SUMY*YBAR
      IF (E.EQ.0.) GOTO 5
      RSQ = C*C/(D*E)
      U = FLOAT(N-2)
```

```
      IF (U.LE.0.)GOTO 6
      F = C*C/D
      SSYX = (E-F)/U
      IF (SSYX.LT.0.) GOTO 6
      SYX = DSQRT(SSYX)
      G = DSQRT(D)
      SB = SYX/G
      RETURN
    4 B = 0.
      R = YBAR
    5 RSQ = 0.
      RETURN
    6 SB = 0.
      SYX = 0.
      RETURN
      END
C
       SUBROUTINE PRORATE
C
C      THIS SUBROUTINE READS INFORMATION AND DATA FOR PRORATE SUBTABLES
C                  AND FITS TO MASTER TABLE DATA.
C
      COMMON/AREA 1/IANN,ICARDM,ICARDS,ICUE,ICYEAR,IDONE,IFEED,IFIRST,
     1IK1,IMON,INOUT,IPOSI,IQTR,ISTATE,ISINGL,IYEAR,IREG,IX1,IX2,ITRANS,
     2JMON,JQTR,KRATE,LPRJ,MPER,LIM,ND,NFILE,NFIT,NK,NLANG,NMON,NRUNS,
     3NOEXCP,NOLOOP,NOMOD,NP,NPRINT,NPUNCH,NQTR,NREAD,NT,NYR,IPEROD(180)
      COMMON/AREA 3/ATRCEP,CONST,INOINT,NDIST,NFORM,W,WRATE,BCOEF(10),
     1IDIST(10),IEXCP(10),CONHED(80),DOCOUN(80),PARHED(80),CONVRT(180),
     2FACTOR(180),IYRPR(180),JPEROD(180),IHEAD(200),IPWH(800),JPWH(800)
    9 FORMAT (12I4)
   99 FORMAT (8X,8F9.0)
   96 FORMAT (20A4)
  105 FORMAT (13X,I4,F9.4)
C
C  V. READ COMMAND VALUES FROM DISK FILE "INPUT.PPJ"
C
C     1. Read Commands for Type of Projection Model and Analysis
  195 READ (NREAD,9,END=190) ISTATE,IX1,IX2,NK,NFORM,ICYEAR,LPRJ,IREG,
     1ITRANS,INOINT,NLANG
      NO = NK + NP
      IF (ISTATE.EQ.0) GOTO 190
C
C     2. Read Commands for Special Features Invoked for the Run
      READ (NREAD,9) NOLOOP,ISINGL,IFEED,NOMOD,ICARDM,ICARDS
C
C     3. Read Number and Sequence of Districts for Subtotals
C        NDIST  = Number of subcategories (districts)
C        IDIST1 = Number of first district
C        IDIST2, IDIST3 ... IDIST10 = Numbers of remaining districts

C   Note: If total projections to be prorated are not divided by
C         district, enter 1 in the first field
```

```
      READ (NREAD,9) NDIST,(IDIST(I),I=1,10)
C
C     4. If Regression Used to Estimate Prorate Data, Read Y-Intercept
C        and B-Coefficients for X1 through Xn.
C       Omit this step if Y prorate data provided directly (IREG = 0)
C
      IF (IREG.EQ.1) READ (NREAD,511) ATRCEP,(BCOEF(I),I=1,NOLOOP)
  511 FORMAT (10F7.5)
C
C     5. If Used, Read Command Control for Override Data
C        NOEXCP = Number of periods for which override data provided
C        IEXCP  = Period identification for override years, starting
C                 with the first one
C     Omit this step if data provided directly (IYES = 0)
C
      IF (IREG.EQ.1) READ (NREAD,9) NOEXCP,(IEXCP(I),I=1,NOEXCP)
C
C     6. If Used, Read Transition Factors for Superimposing
C       Omit this step if ITRANS = 0
C
      IF (ITRANS.EQ.0) GOTO 5
      READ (NREAD,511) (FACTOR(I),I=1,10)
      DO 6 I = 11,NO
    6 FACTOR(I) = FACTOR(10)
    5 CONTINUE
C
C     7. If Used, Read First Year Multiplier for Conversion Table
C
      IF (IFEED.NE.1) GOTO 500
      READ (NREAD,105) IFIRST,CONST
      DO 507 I = 1,NO
  507 CONVRT(I) = CONST
C
C     8. Read Remaining Year Conversion Factors, If Used
C        Insert zeros if conversion constant over time
C        Omit the step if conversion tables not to be made
  508 READ (NREAD,105) IYEAR,VALUE
      IF (VALUE.EQ.0.0) GOTO 500
      IPOSI = IYEAR-IFIRST+1
      CONVRT(IPOSI) = VALUE
      GOTO 508
  500 IX1 = IX1 + 1
      IX2 = IX2 + 1
C
C     9. Read two title lines and eight header lines for prorate tables
      READ (NREAD,96) IHEAD
C
C    10. If Used, Read four title lines for conversion tables
      IF (IFEED.EQ.1.OR.ITRANS.EQ.1) READ (NREAD,96) PARHED
C
C    11. Read Footnotes for the Prorate Tables, four lines for two
C        footnotes of up to 132 characters and/or spaces each
```

```
      READ (NREAD,96) DOCOUN
  300 CONTINUE
  190 RETURN
      END
C
      SUBROUTINE TABLES (LAP,LONVEC,LOTVEC)
C
C   THIS SUBROUTINE PRINTS TABLE TITLES AND COLUMN HEADINGS
C
      COMMON/AREA 1/IANN,ICARDM,ICARDS,ICUE,ICYEAR,IDONE,IFEED,IFIRST,
     1IK1,IMON,INOUT,IPOSI,IQTR,ISTATE,ISINGL,IYEAR,IREG,IX1,IX2,ITRANS,
     2JMON,JQTR,KRATE,LPRJ,MPER,LIM,ND,NFILE,NFIT,NK,NLANG,NMON,NRUNS,
     3NOEXCP,NOLOOP,NOMOD,NP,NPRINT,NPUNCH,NQTR,NREAD,NT,NYR,IPEROD(180)
      COMMON/AREA 3/ATRCEP,CONST,INOINT,NDIST,NFORM,W,WRATE,BCOEF(10),
     1IDIST(10),IEXCP(10),CONHED(80),DOCOUN(80),PARHED(80),CONVRT(180),
     2FACTOR(180),IYRPR(180),JPEROD(180),IHEAD(200),IPWH(800),JPWH(800)
    3 FORMAT (' ',132('='))
    4 FORMAT (' ',132('-'))
    5 FORMAT ('/')
   23 FORMAT (' ',2(33A4,/))
   24 FORMAT (' ',33A4)
   25 FORMAT ('1')
   27 FORMAT (' ',100X,'(Continued)')
   28 FORMAT (' ',100X,'(Continuo)')
   29 FORMAT (' ',100X,'(Continu)')
   31 FORMAT (' LOGARITHM PROJECTION ')
   32 FORMAT (' PROYECCION LOGARITHMICA ')
   33 FORMAT (' PREVISION LOGARITHMIQUE ')
   41 FORMAT (' EXPONENT IS ',F5.2)
   42 FORMAT (' EXPONENTE ES ',F5.2)
   43 FORMAT (' L'' EXPOSANT EST ',F5.2)
   51 FORMAT (' ANNUAL GROWTH RATE IS ',F5.4)
   52 FORMAT (' TASA DE CRECIMIENTO ANUAL ES ',F5.4)
   53 FORMAT (' LE TAUX DE CROISSANCE ANNUEL EST ',F5.4)
  509 FORMAT (' ',11X,121('-'))
      WRITE (NPRINT,25)
      NE = ND - 1
      NU = NK + 1 - ND
      IF (INOUT.GT.1.OR.IK1.GT.1.AND.NLANG.EQ.0) WRITE (NPRINT,27)
      IF (INOUT.GT.1.OR.IK1.GT.1.AND.NLANG.EQ.1) WRITE (NPRINT,28)
      IF (INOUT.GT.1.OR.IK1.GT.1.AND.NLANG.EQ.2) WRITE (NPRINT,29)
      IF (IDONE.EQ.0) GOTO 102
      WRITE (NPRINT,23) (PARHED(I),I=1,33),(PARHED(I),I=41,73)
      GOTO 103
  102 WRITE (NPRINT,23) (IHEAD(I),I=1,33),(IHEAD(I),I=41,73)
  103 WRITE (NPRINT,24) (IHEAD(I),I=81,113)
      IF (NOMOD.EQ.1) GOTO 69
      IF (LPRJ.EQ.1) GOTO 68
      IF (ICUE.EQ.0.AND.KRATE.EQ.1) GOTO 72
      IF (NLANG.EQ.0) WRITE (NPRINT,41) W
      IF (NLANG.EQ.1) WRITE (NPRINT,42) W
      IF (NLANG.EQ.2) WRITE (NPRINT,43) W
```

```
      GOTO 69
   72 IF (NLANG.EQ.0) WRITE (NPRINT,51) WRATE
      IF (NLANG.EQ.1) WRITE (NPRINT,52) WRATE
      IF (NLANG.EQ.2) WRITE (NPRINT,53) WRATE
      GOTO 69
   68 IF (NLANG.EQ.0) WRITE (NPRINT,31)
      IF (NLANG.EQ.1) WRITE (NPRINT,32)
      IF (NLANG.EQ.2) WRITE (NPRINT,33)
   69 WRITE (NPRINT,3)
      WRITE (NPRINT,24) (IHEAD(I),I=121,153)
      WRITE (NPRINT,24) (IHEAD(I),I=161,193)
      WRITE (NPRINT,509)
      IN3 = (LAP-1)*80+1
      IN4 = IN3 + 32
      IN5 = IN3 + 40
      IN6 = IN5 + 32
      WRITE (NPRINT,24) (JPWH(I),I=IN3,IN4)
      WRITE (NPRINT,24) (JPWH(I),I=IN5,IN6)
      WRITE (NPRINT,4)
      WRITE (NPRINT,5)
      RETURN
      END
```