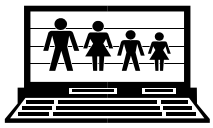
SPSD/M 

Tool User's Guide

This guide describes a number of utilities supplied with but not directly part of SPSD/M. They include the grep, fcomp, and kmake utilities for use in `glass box' mode, as well as utilities that interface between SPSD/M tables and spreadsheet packages.

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Table of Contents

Introduction

This guide describes a number of stand-alone tools that are not directly part of the SPSM program. They are designed to extend the capabilities of SPSM in various ways.

- Section 2 describes a related set of tools that together constitute the SPSM spreadsheet interface facility.

- Section 3 describes utilities that are of general use to the `glass box' user. It includes a description of the compparm utility, which produces a report showing all differences between two parameter files.

- Section 4 describes utilities mainly of use in `glass box' mode, although the grep utility is of more general applicability.

Those tools which are stand-alone executable programs or MS-DOS .bat files can be invoked simply by typing their name, along with any necessary arguments, on the command line. For example, to display all differences between the two parameter files ba87.mpr and ba88.mpr, the user would type the following command:

```
C>compparm ba87.mpr ba88.mpr
```

If the instructions in the ***Installation Guide*** were followed, the tools will be found in the \spsm\win32 directory. In order to access the tools from any directory it is necessary to include the path in your environment.

Syntax Notation

When the syntax of particular tools is given, the following notation is used:

- compparm leading terms given in a courier font represent the command used to invoke the tool.

- [-t] square brackets indicate an option which may or may not be used.

- [-|!] one or more vertical bars separating characters (or character strings) within option brackets indicate that more than one value is available for that option. The vertical bar functions as a separator only and is not entered when invoking the command. Usually the characters function as flags designating that the option is on or off, although some options have multiple values.

- file1 terms presented in italics usually represent mandatory arguments that must be present on the command line for the tool to be invoked (eg. input and output file names). The exception is when they represent a value associated with an option that the user must enter.

SPSD/M Utilities

IMPORT

The import utility converts each table found in a .tbl file into the format required by spreadsheet package like Excel. The import utility is invoked as follows:

import [-b] [-t] [-f] [-s] infile stemname

where:

- -t flag indicates that numeric fields are to be left in their formatted character form, and not converted into numbers.
- -b flag indicates that the vertical bar symbols (|) will be retained as well.
- -f flag indicates that the French comma is used as a decimal separator in table conversion to csv format instead of a dot.
- -s flag indicates that the column headers will be truncated so that they only take up 1 row in the table.
- infile is the name of a file containing SPSM tables.
- stemname is a string which is used to generate the names of the resulting files. The files produced have the form stemname_tableid.prn.
- tableid identifies the extracted table. It consists of the alphanumeric string that follows an instance of the string `Table' in infile.

In the case of tables with three or more dimensions, a numeric sub-identifier is appended to tableid. For example, assuming that the file run1.tbl exists in the current directory, if the command:

C>import run1.tbl tab

is given, and if run1.tbl contains built-in tables 0, 2, and 2A, as well as user-defined tables 1U and 2U, then import would generate the following files:

tab_0.csv
tab_2.csv
tab_2A.csv
tab_1U.csv
tab_2U1.csv
tab_2U2.csv
tab_t.csv

The file tab_t.csv contains the page header lines found at the top the run1.tbl file. These page header lines are not included in any of the .csv files. The above example assumes that the user-defined Table 2U was three dimensional and had two slices.

import normally converts numeric table entries into numeric spreadsheet entries. This allows the tables to be manipulated numerically inside the spreadsheet once they

have been imported. The optional -t flag indicates that numeric fields are to be left in their formatted character form, and not converted into numbers. If in addition the -b flag is specified, the vertical bar symbols (|) will be retained as well.

SPSMITER: SPSM GOAL SEEKING FACILITY

The SPSM goal seeking facility provides a means to modify the dollar value of one or more specified parameters, through an iteration scheme, to produce a desired value of a particular variable in the tax/transfer function. The facility now allows both scalar and array parameters to be selected for goal seeking. The results of the goal seeking facility can then be written to the originating SPSM results file, adjusting the applicable parameters.

This tool is useful for answering "what if" type questions. For example, what would be the federal surtax rate necessary to achieve revenue neutrality, given the federal manufacturer's sales tax is eliminated in 1991? It would be possible to answer this question by first running a 1991 base case to observe the level of federal tax revenue obtained when manufacturer's sales taxes are collected and then creating a variant case which sets manufacturer's sales taxes to zero.

The analyst could then create a table using the X-tab Facility (see the ***User's Manual***, and ***XTab User's Guide*** for a description of the X-tab facility) which displays the federal tax revenue difference between the two cases (the loss in federal tax revenue due to the elimination of the tax). The goal seeking facility could then be used to estimate the level of federal surtax needed to reduce the difference between the base and variant runs to zero, thus obtaining revenue neutrality.

The user may specify either Newton's iterative method or a binary search as the iteration scheme. Both methods require the user to provide an initial estimate of the scalar parameter to be adjusted. In addition, the binary search option requires both an upper and lower limit for the parameter to be adjusted. If it is sufficiently close to the solution the procedures will converge, otherwise it will guess again. The following section provides the details necessary to access and use the spsmiter facility.

Iteration Facility Syntax

All commands necessary to execute the spsmiter facility must be entered in batch mode or from a batch file (***User's Guide*** contains a description of the SPSM batch facility). To overview the format of the command, type spsmiter. The following explanation of the spsmiter facility will be output to the screen:

usage: spsmiter [-t] [-a] [-b<lower/upper>] sample model cprfile tableid row col target tolres parm

-t	- just print action summary (optional)
-a	- modify parameters in .apr instead of .mpr file
-b	- use binary search instead of Newton's method
sample	- sample size(s) (eg. 0.05/1.00)
model	- name of the model (normally spsm)
cprfile	- name of the cpr file to be iterated to convergence

tableid - table identification number (Eg.2)
row - table row number (counting headings)
col - table column number (counting headings)
target - target value
tolres - tolerance for convergence
parm - name of the parameter to be modified to obtain convergence (and any extra)

Example:

C:\> spsmiter 1.00 spsm.exe test.cpr 0 7 2 235000 10 CTCPC

Description of spsmiter options:

[-t]:

When the expression -t is inserted between the spsmiter command and the sample expression in the batch command, only the action summary will be printed to the screen. This option should be used to check whether the spsmiter command statement has referred to the tables and the table values the analyst wanted. Analysts should note that if a variant results file has not been created the INPVARMPR control parameter will contain the original spsm model tax/transfer parameters and therefore any iteration conducted may damage this file. Checking the action summary before performing an iteration should prevent this mistake from occurring. An example of the action summary is given below – which describes the phrases produced during the iteration for the Worked Example following the Description of spsmiter options:

ACTION SUMMARY:

The Program spsm.exe will be run with the test.cpr control parameter file. The FSURR1 parameter (along with 0 other) in the file test.mpr will be modified until the entry in row 24 and column 2 of table 0 in file test.tbl attains the desired value of 89592.5. The current value of this entry is 78777.9.

[-a]:

When the expression -a is inserted between the spsmiter command and the sample expression in the batch command, the facility will modify an adjustment parameter found in the .apr file as opposed to a model parameter found in the .mpr file. This gives the user the ability to adjust certain growth parameters to produce a desired model variable. For example, one could adjust the growth factor controlling farming income in Saskatchewan to force the modeled farm income variable to conform to a control total.

[-b<lower/upper>]:

When the expression -b is inserted between the spsmiter command and the sample expression in the batch command, the facility will use the binary search iteration scheme instead of Newton's method. This scheme is more effective when the relationship between the parameter to be adjusted and the

target variable is not smooth and continuous. Note that both an upper and lower bound for the parameter must be specified along with the target variable like –b0.5/1.3 where 0.5 is the lower limit and 1.3 is the upper limit.

sample:

The sample command allows the user to select the sample size for the second iteration, Phase II, from 0% to 100% of the database. Phase I will run the iteration using 10% of a 100% SPSD database file. However if the iteration refers to SPSM output which was run using the 5% sample of the database, then the Phase I iteration will be run using the 5% sample and not 10% (the message 10% will nonetheless continue to be output to the screen). The user should note that an iteration procedure executed on 100% of the database may be time consuming, and it is therefore useful to perform the iteration using just Phase I by setting the sample command to zero, checking the result and then running the iteration again with the sample command set to one.

If only one sample is given then Phase I is automatically run with the given sample size and Phase II at 100%. It is possible to skip Phase I by setting sample in Phase I to 0% and Phase II at 100%: 0.0/1.0.

model:

The model command should refer only to the spsm.exe file unless the user has created another version of the model through the glass box procedure.

cprfile:

The cprfile command should refer to the .cpr file which produced the table containing the variable selected for goal seeking.

tableid:

The tableid command identifies the table identification number to be used. In the example given below, table 0 from test.cpr was selected. Both built-in tables and tables generated with the X-tab Facility (see ***User's Guide*** for a description of the X-tab Facility) can be selected.

row:

The row command identifies the row within the specified table which contains the variable selected for goal seeking.

col:

The col argument identifies the column within the specified table which contains the variable selected for goal seeking. The row and column

numbers identify the cell within the table which contains the variable selected for goal seeking. The variable can be either a built-in variable or a user-defined variable (see *User's Guide* for a description of the User-defined Variable Facility). In the below example, the variable Federal Tax is located in row 24 and column 2 of table 0.

target:

The target value is the desired dollar amount of the variable the analyst has identified through the row and column coordinates. In the example below, the target value the analyst has chosen for federal tax revenue is $89,592.50.

tolres:

The tolerance for convergence should be set to some value, in our example it is 10 million (10), therefore an iteration result within 10 million dollars of the target value will be selected and the spsmiter procedure will stop. The user should note that the smaller the tolerance for convergence the longer the facility's processing time will be.

parm:

Up to 50 tax and transfer parameters can be selected for modification to obtain convergence. In order to process parameters which contain a vector or matrix of values give the parameter name along with the cell you wish to modify. For example, if you want to modify the marginal tax rate for the lowest income group, the parameter should be written as FTX[0][2] for the first row and third column. The user can identify which parameters are scalars by referring to the *Parameter Guide* or by observing the structure of the parameters by browsing through the .mpr file. In the worked example in the next section, the parameter FSURR1, federal surtax rate 1, was selected for modification.

Worked Example

Executing the following command in batch mode:

```
D:\SPSMTEST> spsmiter 0 spsm.exe test.cpr 0 24 2 89592.5 10 FSURR1
```

Produced these results:

```
ACTION SUMMARY:
```

The Program spsm.exe will be run with the test.cpr control parameter file. The FSURR1 parameter (along with 0 other) in the file test.mpr will be modified until the entry in row 24 and column 2 of table 0 in file test.tbl attains the desired value of 89592.5. The current value of this entry is 78777.9.

```
Phase I: 10% runs
Iteration = 0 (10%) FSURR1 = 0.050000 Result = 78777.9 Error = -10814.6
```

Iteration = 1 (10%) FSURR1 = 0.055000 Result = 79042.8 Error = -10549.7
Iteration = 2 (10%) FSURR1 = 0.254126 Result = 89598.2 Error = 5.7

Phase II sample is zero, exiting

We can answer the question posed above: "What would be the federal surtax rate necessary to achieve revenue neutrality, given the manufacturer's sales tax is eliminated in 1991?" The goal seeking facility estimated that the federal surtax rate would increase from 5% to 25.4% for revenue neutrality to be maintained, i.e. for federal tax revenue to remain unchanged after the manufacturer's sales tax is eliminated.

The analyst can chose to write the results of the goal seeking facility to the test.mpr file thus changing the applicable variable values within the built-in tables, and within the X-tab tables the analyst had created, to reveal the effect of the new surtax.

COMPPARM: PARAMETER FILE COMPARISON UTILITY

The stand-alone utility compparm will compare any two parameter files and produce a report detailing their differences. A number of options are available to control compparm's operation. These options all have default values which are appropriate for on-line use with complete parameter files, or portions of parameter files (i.e. parameter include files).

In addition, compparm contains an option which can be used to create a parameter include file (ie. those with the suffix .cpi, .api, or .mpi). The difference between two parameter files will be contained in an include file which can be read by SPSM. This option is very useful when updating parameter files to operate under a new release or glass box version of SPSM (see section below on updating parameter files).

The full syntax for invoking compparm is as follows:

compparm [!|-]i [-w width] [[-|!]sep] [[!|-][12|1|2]]... file1 file2

where:

[!|-]i

> This optional argument specifies whether the compparm utility will create a parameter include file containing the differences between two parameter files. The default is !, which results in a compparm report instead of an include file. The standard compparm report lists the values for file1 in one column and the values for file2 in an adjacent column.

-w width

> This optional argument specifies the total number of print positions that the resulting report will occupy. The default is 80, which is appropriate for screen display. Parameter values longer than width/2 are truncated. Truncation is indicated by a trailing `+' character on the parameter value.

[-|!]sep

This optional argument specifies whether the user wishes horizontal separator lines and comments to be included in the report (-) or not (!). The default is -, which results in a fully formatted and commented report. The user may wish to turn off the sep option to create a report which is more easily converted into parameter include files.

[!|-]12

This optional argument specifies whether or not the user wishes the values for parameters common to the two files to be compared. The default is to have them compared.

[!|-]1

This optional argument specifies whether or not the user wishes parameters found only in the first file specified (file1) to be output. The default is not to output these parameters in the report.

[!|-]2

This optional argument specifies whether or not the user wishes parameters found only in the second file specified (file2) to be output. The default is not to output these parameters in the report.

file1, file2

These are required arguments, being the names of existing SPSD/M parameter files, consisting of parameter names and associated numeric or text values.

The input files do not have to be complete parameter files, and the parameters can be in any order in the input files. The report will be ordered in the same way that file1 was ordered.

If the user types the command

```
C>compparm \spsd\sq88.mpr \spsd\ba88.mpr
```

the resulting report would be written to the screen and would appear as follows (only part of the report is shown here):

```
                    PARAMETER FILE DIFFERENCE REPORT
================================================================================
          \spsd\sq88.mpr            |          \spsd\ba88.mpr
  Mon Oct 17 12:44:14 1988          | Mon Oct 17 12:41:36 1988
================================================================================
 ###
 ## 2.3.1 Parameter File Description
 ###
================================================================================
              Description of tax/transfer parameter file
 MPRDESC      1988 pre-reform          MPRDESC      1988 reform
================================================================================
 ###
 ## 2.3.2.6 Federal Sales Tax Credit
```

```
 ###
================================================================================
                Federal sales tax credit amount for filer
 FSTCF          50.00                FSTCF          70.00
--------------------------------------------------------------------------------
               Federal sales tax credit amount for spouse
 FSTCS          50.00                FSTCS          70.00
--------------------------------------------------------------------------------
              Federal sales tax credit amount for dependant
 FSTCC          25.00                FSTCC          35.00
--------------------------------------------------------------------------------
                Federal sales tax credit reduction level
 FSTCL        15000.00                FSTCL        16000.00
================================================================================
```

The output of compparm may be redirected to a file or to a printer. In the latter case, it might be desirable to increase the report width to avoid possible truncation of parameter values. This can be accomplished by typing a line such as the following:

```
C>compparm -w132 sq88.mpr ba88.mpr >prn
```

Use of compparm to Update Parameter Files

The following example updates an old parameter file (i.e. version 4.0) with the changes contained in a new parameter file (i.e. version 5.0) and is only an illustration of the use of compparm. **It is strongly suggested to always proceed with the full implementation of SPSD/M because new parameters are associated with changes in programs or new programs**.

When using compparm, the analyst is advised to maintain the default settings for options 1, 2, and 12 to ensure that the files become fully updated. For example, to update the control parameter file \spsd3\ba88t.cpr (version 4.0) to reflect the changes contained in the parameter file \spsd\ba88t.cpr (version 5.0) the analyst would enter the following command:

```
C\SPSMCOMP>compparm -i \spsd3\ba88t.cpr \spsd\ba88t.cpr > update.cpi
```

The resulting include file, update.cpi would be written to the SPSMCOMP directory. During an SPSM run the analyst can read in this control parameter include file to update the old .cpr file. The include file created from this compparm command is as follows (only part of the include file is shown):

```
################################################################################
## Include file to convert from '\spsd3\ba88t.cpr' to '\spsd\ba88t.cpr'  ##
################################################################################
### ## 2.1.1 Descriptive information on this SPSM run ###
CPRDESC      ba88 with table 0    # Description of SPSM run
ALGDESC                           # Names of standard and alternate algorithms
+---------+-------------------------------+--------------------- -------+\
|Algorithm|          Standard             |         Alternate           |\
+---------+-------------------------------+-----------------------------+\
|drv      | $Revision: 3.1 $     Aug 15/89 | None             Aug 15/89 |\
|ui       | $Revision: 3.1 $     Jul 31/89 | None             May 19/89 |\
|famod    | $Revision: 3.1 $     Jul 31/89 | None             May 19/89 |\
|oas      | $Revision: 3.1 $     May 19/89 | None             May 19/89 |
### ## 2.1.2 SPSD input files ###
```

```
INPSPD       /spsd/v40y88t.spd    # Name of SPSD file (in)
### ## 2.1.3 Database adjustment ###
INPAPR       /spsd/ba88_88.apr   # Name of database adjustment parameter file

### ## 2.1.4 Variant Information ###
VARALG       Version 4.00: 82-89  # Name of variant algorithm
### ## 2.1.6 Subsampling, random number seed ###
SAMPLE       0.049799688         # Size of sample obtained
##############################################################################
## Parameters Removed: ##
##############################################################################
GLASPARM                         # User Specified Glass box parameter
##############################################################################
## Parameters Added: ##
##############################################################################
BRKFLAG          1           # Activate interception of `Break' key
BEEPFLAG         0           # Beep on completion
TPFLAG           0           # Turning point facility activation flag
ASCEXTPRC        0           # Number of digits of extra precision
```

The analyst should note that any parameters created in the glass box mode and contained in file1 are commented in the parameters removed section of the include file. To make these parameters active in the updated parameter file, remove the comment marker which precedes the parameter (#).

SPSDINFO: SPSD/M FILE HEADER UTILITY

SPSD database files and SPSM binary results files have a header which contains information on the file's creation date, version number and a number of other useful items. The spsdinfo utility will display this information in printable form. For example, if the user issues the command:

```
C>spsdinfo \spsd\v90y97t.spd
```

the following report would be printed on the user's terminal:

```
File        : \spsd\v90y97t.spd
Type        : spd
Database ver.: 9.00
Binary ver.  : 9.00
Date        : Mon Jul 16 14:45:13 2001
Label       : Version 90
Licensee    : Internal StatsCan use only
Households  : 3990
Numbers     : 0
(unused)    : 0
(unused)    : 0
```

The tool produces additional information pertaining to any user variables contained in .mrs files. Specifically, any variable labels or classification level labels created in UVAR will be displayed if the associated variable was specified in OUTMRSVARS.

The following example illustrates this feature:

```
File        : ba88t.mrs
Type        : mrs
```

```
Database ver.: 4.00
Binary ver.  : 4.00
Date         : Tue Nov 27 10:19:05 1994
Label        : Current values for 88
Licensee     : Statistics Canada
Households   : 2764
Numbers      : 23283
sizeof(MP)   : 11406
 #bytes uv   : 190
Variables    : immicons newtax1 newinc1
Variable info:
label(newtax1)="newtax1";
label(newinc1)="Total income Group";
levels(newinc1)=
          "Min-5,000",
          "5,000-10,000",
          "10,000-50,000",
          "50,000-100,000",
          "100,000-MAX";
```

PUPDATE: SPSM PARAMETER UPDATE FACILITY

The **pupdate** utility is used to grow parameters in the ".mpr" (tax/transfer model parameters) or ".apr" (database adjustment parameters) files. Partial include files (".mpi" ".api") can also be grown.

Pupdate creates a parameter file (out=outfile) by growing a parameter file (cur=file1) using given update factors (name=value). If a second file is given (nxt=file2), then the output file will only grow parameters which were grown or which are missing in the second file. For example, if in the second file a tax rate is given without an update statement whereas a tax credit was grown using CPI, the output file will keep the tax rate from the second file, but grow the tax credit using the appropriate update factor.

Values for update parameters are supplied on the command line upon invocation in the form 'name=value' or passed to pupdate in a file.

Syntax:

pupdate cur=*file1* [nxt=*file2*] out=*outfile* [name=*value*]...

Or

pupdate -f *filename* where *filename* contains

cur=*file1*
out=*outfile*
[nxt=*file2*]
[name1=*value1*]
.
.
.

[name=*value*]
[CURNAME=label]

Parameter files

cur - original parameter file.
nxt - second parameter file (optional)
out - new parameter file

Source and update statements

Each parameter that can be grown will have the following comment statements:

Source - origin of parameter value.
Update - method of scaling or setting the value.

e.x.

```
GISST     3        GIS take-up rate: single pensioner by benefit level
            0    0.322   (0.0005)
          701    0.680   (0.0001)
         2909    1.000   (0.0001)
                    # Source: Grown from ba99.mpr using CPI=1.014
                    # Update: Factor[1]=CPI
```

Source

The parameter value's source will either be drawn from a number of official publications or from information generated by pupdate.

e.x. # Source: Redbook, 1995 Edition
or
Source: Grown from ba99.mpr using CPI=1.014
Source: Copied from ba99.mpr
Source: Given as LABEL=...

Update

Any parameter having a update statement will be grown, others will be simply copied to the output file. The update statement will contain one of the following entries preceded by the update header "# Update: ":

Value=*value* - Sets parameter or rows of parameter to *value*.
Factor=*value* - Multiplies *value* times all column values in row(s) to compute grown values.
Factor[]=*value* - Multiplies *value* times selected columns values in row(s) to

compute grown values.

e.x. # Update: Value=LABEL
Update: Factor=CPIM3
Update: Factor[2,3]=DEFAULT

Cur File

In the case where only a single file (*cur)* is passed as an argument and where an update statement and factor are found, the parameter will grown. If no update statement is found, the parameter is simply copied from 'cur' to the to the output file. If an update statement is found and no update factor is provided, an error will be generated.

Nxt File

In the case where a second file is passed (nxt), if the parameter is not found in 'nxt' or if the source given in 'nxt' is 'Grown', 'Copied' or, 'Given' then a grown entry from 'cur' is written to the out file. If the source statement contains no update information, the parameter information is simply copied from 'nxt' to the out file.

Arguments

cur - previous years file
nxt - optional second file
out - the resulting output file
CURNAME - base year file; if not given will default to CUR file
all the update factors used in the cur file

Errors and warnings

Warnings will be issued if a parameter source statement is not found in either 'cur' or 'nxt' or if different update methods are used for the same parameter in the two files.

Error messages will be issued and the program halted if files cannot be found or referenced parameters were not passed as command line arguments or contained in the command file.

Update factors currently used in mpr files

LABEL description of applied process
CPI Consumer Price Index
CPIM3 Consumer Price Index over 3%
CPINF Consumer Price Index - Newfoundland
CPIPE Consumer Price Index – Prince Edward Island
CPINS Consumer Price Index – Nova Scotia
CPINB Consumer Price Index – New Brunswick
CPIQU Consumer Price Index - Quebec
CPION Consumer Price Index - Ontario
CPIMA Consumer Price Index - Manitoba

CPISA Consumer Price Index - Saskatchewan
CPIAL Consumer Price Index - Alberta
CPIBC Consumer Price Index – British Columbia
AIW the average industrial weekly earnings
UIR growth rate for UI/EI maximum earnings
NONE set to 1, used for deflation
DEFAULT set to 1, used for deflation
YEAR Target year (4 digits)

Update factors currently used in apr files

LABEL description of applied process
CPI Consumer Price Index
AIW the average industrial weekly earnings
UIR growth rate for UI/EI maximum earnings

Syntax

Values for update parameters are supplied on the command line upon invocation in the form `name=value' or passed to pupdate in a file.

pupdate cur=*file1* [nxt=*file2*] out=*outfile* [name=*value*]...

Or

pupdate -f *filename* where *filename* contains
cur=*file1*
out=*outfile*
[nxt=*file2*]
[name1=*value1*]
.
.
.
[name=*value*]
[CURNAME=*label*]

Examples:

To update the entire ba99.mpr to the next year with a 3% federal CPI growth rate:

C:> pupdate cur=ba99.mpr nxt=ba00.mpr LABEL=Higher_Growth YEAR=2000 CPI=1.03 CPIM3=1.0 AIW=1.026 CPIR=.952 UIR=1.000 CPINF=1.018 CPIPE=1.018 CPINS=1.018 CPINB=1.018 CPIQU=1.018 CPION=1.018 CPIMA=1.018 CPISA=1.018 CPIAL=1.018 CPIBC=1.018 DEFAULT=1.0 NONE=1.0 out=myout.mpr

OR

C:> pupdate -f growapr.lst

where growapr.lst contains the following entries:

```
cur=ba99.mpr
nxt=ba00.mpr
LABEL=Higher_Growth
YEAR=2000
CPI=1.03
CPIM3=1.0
AIW=1.026
CPIR=.952
UIR=1.000
CPINF=1.018
CPIPE=1.018
CPINS=1.018
CPINB=1.018
CPIQU=1.018
CPION=1.018
CPIMA=1.018
CPISA=1.018
CPIAL=1.018
CPIBC=1.018
DEFAULT=1.0
NONE=1.0
out=growme.mpr
```

To grow the database adjustment files past to 2004:

```
C:> pupdate cur=ba96_03.apr LABEL=Grow_to_2004 CPI=1.018 AIW=1.026 UIR=1.000
out=new04.apr
```

To grow an mpi file which only contains the parameters for tax on taxable income in BC:

```
C:> pupdate cur=bctest.mpi out=newbc.mpi CPIBC=1.03 NONE=1
```

BLDSPD: .SPD DATABASE CREATION UTILITY

bldspd provides a means to convert ascii output files, of a specific format, into a compressed machine readable format which can be read by the spsm as an spsd database file; therefore, the user is able to create a database containing a desired subset or a user revised version of the existing SPSD database (v90y97.spd).

For example, the user may wish to create a database containing only one particular household, for use with the turning point facility, or to create a database containing rare household cases which may be used to debug new algorithms. Advanced "shaping" of the data may also be performed by experienced users.

Note that when a subset is created, the results will change slightly since the random numbers will be different. This implies that transfers which depend

on take-up (see gis and GISST for example) may change. If you want to get the same results, you will need to flag off all relevant take-up parameters.

The build programs expect fixed field ASCII files. To easily access this ascii style, read in the control parameter include file /spsd/bldspd.cpi as well as the database adjustment parameter include file /spsd/bldspd.api.

Note that these files use the ASCII output facility output style (see the ***Parameter Guide*** for a description of the parameter ASCSTYLE). ASCSTYLE=5 is a fixed format which contains all variables listed in ASCVARS, is blank delimited, and contains all records per case beginning with a household record which is followed by individual records.

The full syntax needed to compress the ascii output file into a machine readable file format using the bldspd utility is as follows:

bldspd [-a][-x] file1 file2

where:

[-|!]a

This optional argument specifies whether or not the user wants the ascii file to be compressed and appended to an existing compressed file (.spd). The default is ! which results in the creation of a new compressed file. The user may want to use the append option to create a compressed file from more than one ascii file (for example, an ascii file which is so large it must be separated into sections to conserve disk space).

[-|!]x

This optional argument specifies whether or not the ascii file contains additional 'extra' variables. The default is to read extra database variables. These are fields left intentionally blank. Users can employ these variables in either Glass Box applications or for database rebuilding.

file

file1 must be an ascii output file (.prn) formated in ASCSTYLE=5. file2 must be a new compressed file (.spd) if option a is not used. If option a is used then file2 must be an existing compressed file (.spd).

The bldspd.cpi can be found in the /spsd directory and includes 23 extra variables for the user. These include files bldspd.cpi and bldspd.api are used to produce the ASCII input files used by bldspd.exe.

Example:

C:/SPSMBLD> bldspd test1.prn test1.spd

The ascii output file, test1.prn, will be converted into compressed format and written into file test1.spd. To run SPSM with the new database, test1.spd, set the control parameter INPSPD to test1.spd.

In the previous example, test1.prn read the output layout from the file /spsd/bldspd.cpi which provide the final layout for the input file in SPSD/M, and read the file /spsd/bldspd.api. Any failure to read those two files will result in serious mistakes.

BLDFXV: .FXV DATABASE CREATION UTILITY

bldfxv provides a means to convert ascii output files into a compressed format, readable by the SPSM as a Family Expenditure Database; thus, the user can modify the existing SPSD famex database to adjust the SPSD to reflect different assumptions about family expenditures.

ASCII output files must have a specific format as described below. This format may be invoked by reading the file \spsd\bldfxv.cpi as well as the corresponding \spsd\bldfxv.api.

The full syntax for invoking bldfxv is as follows:

Bldfxv [-a] file1 file2

where:

[-|!]a

This optional argument specifies whether or not the user wants the ascii file to be compressed and appended to an existing compressed file (.fxv). The default is ! which results in the creation of a new compressed file. The user may want to use the append option to create a compressed file from more than one ascii file (for example, an ascii file which is so large it must be separated into sections to conserve disk space).

file

file1 must be an ascii output file (.prn) formatted in ASCSTYLE=4. file2 must be a new compressed file (.fxv) if option a is not used. If option a is used then file2 must be an existing compressed file (.fxv).

Example:

C:/MYDIR> bldfxv test1.prn test1.fxv

The ascii output file test1.prn, which was produced using /spsd/bldfxv.cpi, will be converted into the compressed format, test1.fxv. To run SPSM with the SPSD database adjusted to reflect the new family expenditure assumptions, test1.fxv, set the control parameter INPFXV to test1.fxv.

The bldfxv utility can be used to process an ASCII file produced from SPSM when a subset of households was being selected (such as all those in a particular province). However, users must use the following procedure to create the ASCII file, modifying the parameter values given in /spsd/bldfxv.cpi.

1. A user variable with the value 1 for the household must be created, and this

variable should be used instead of fxclohhv in ASCVARS(which is the default in the file /spsd/bldfxv.cpi). So newvar=1/hhnin; or HH:newvar=1; would both be fine.

2. SELSPEC should not include an expression equivalent to or of the form (hdfrstfx==1). or (hdlastfx==1). This will force a FAMEX record to be output for each household otherwise selected.

Together, these changes will result in a file with correctly duplicated expenditure pattern vectors. This change will allow users to create complete sets of .spd, .fxv and .wgt files for particular provinces, resulting in performance improvements if this is their normal mode of use.

In the previous example, test1.prn read the output layout from the file /spsd/bldfxv.cpi which provide the final layout for the input file in SPSD/M, and read the file /spsd/bldfxv.api. Any failure to read those two files will result in serious mistakes.

BLDWGT: .WGT DATABASE CREATION UTILITY

bldwgt provides a means to convert ascii weight files into a compressed format which can be read by the spsm. Through the bldwgt utility the user can modify the existing SPSD weight files to change the composition of the database.

For example, to increase the number of U.I.C. recipients within the database the user could adjust the U.I.C. weights to allocate U.I.C. transfers to more individuals within the database. The user should be aware that although the process for adjusting weight files is straightforward the implications of any adjustment are complex and the user should fully understand all of the interactions between the existing weight files before attempting this procedure.

The full syntax for invoking bldwgt is as follows:

bldwgt [-a] totwgt file1 file2

where:

[-|!]a

> This optional argument specifies whether or not the user wants the ascii file to be compressed and appended to an existing compressed file (.wgt). The default is ! which results in the creation of a new compressed file. The user may want to use the append option to create a compressed file from more than one ascii file (for example, an ascii file which is so large it must be separated into sections to conserve disk space).

totwgt

> This is the sum of weights of the file to be created. It represents the estimated population in numbers of households. In the special case where a

full sample is being created (i.e. SAMPLEREQ is 1.0000) the user may place the value 0 in this field and the bldwgt program will sum the weights on the file.

file

file1 must be an ascii output file (.wgt) formated in ASCSTYLE=4. file2 must be a new compressed file (.wgt) if option a is not used. If option a is used then file2 must be an existing compressed file (.wgt).

Example:

```
C:/SPSMBLD> bldwgt 0 test1.prn test1.wgt
```

The ascii output file test1.prn will be compressed into a machine-readable weight file. This weight file can then be used to adjust the database during an SPSM run (set the control parameter INPWGT to test1.wgt).

BLDMRS: .MRS DATABASE CREATION UTILITY

This tool converts a file of text data into a binary SPSM results (.mrs) file. bldmrs takes three arguments: the first is the number of households, the second is the input ASCII file, and the third is the name of the .mrs file being built. The number of households can be discovered using the spsdinfo on the full database.

The input file to bldmrs follows a particular format that consists of two sections, a header section followed by a data section. The first line of the header section gives the names of the variables. These names can be optionally surrounded by quotes (") and are separated by one or more spaces. This line is followed by an optional section which can provide labels and level information for user variables. This descriptive information is provided as a set of semi-colon delimited SPSM statements using the label and levels statements described in the ***User's Guide***. Lines of descriptive information must start with a lower-case alphabetic character in the first column.

The data section consists of one line for each individual in the SPSD. Each line contains the blank-separated values of the variables for that individual.

The following example illustrates the appearance of the input file used to produce a results file with the SPSM modeled variables for disposable and consumable income. It could also be produced using the text output facility and ASCSTYLE equal to 3.

```
immdisp immicons
0 0
1000 987
25000 22500
.
.
.
```

The next example shows how to create a .mrs file that can be used to modify the province variable in an SPSM run (using the Reference Value Facility).

```
hdprov
5
5
5
.
.
.
```

The following example shows how to create a .mrs file containing user variables. A classification variable for poverty status and a base income variable are defined.

```
baseinc povstat
label(baseinc) = "Base Income";
label(povstat) = "Poverty Status";
levels(povstat) = "Poverty", "Near Poverty", "Non-poverty";
10000 0
10000 0
10000 0
50000 2
.
.
.
```

EXAMPLE: CREATING A SUBSET DATABASE

In the following example, a database for all individuals in Newfoundland, which is a subset of the complete database, is going to be created. The process has three steps and involves at least three separate model runs.

1. BUILD WEIGHT FILE(S) (.wgt)

   A) Run the spsm. Begin the run selecting a default control parameter file and set the output file names to NFLDWGT

   B) Read the include file \spsd\bldwgt.cpi to update the control parameters.

   C) Alter the selection facility parameters and X-tab facility parameters as follows:

   ```
   SELFLAG     1
   SELSPEC     hdprov==NFLD
   XTFLAG      1
   XTSPEC      HH:{units:S=0}
   ```

   D) Use bldwgt.exe to create the new weight file called NFLDYY.WGT where YY refers to the year of the weight file selected during the model run. The sum of weights may be found in the X-tab table in the .tbl file.

   ```
   C:>bldwgt 162282 nfldwgt.prn nfldyy.wgt
   ```

   Because a different weight file is read for each year, you must repeat this entire step for each year for which you want to perform analyses .

2. BUILD FAMEX FILE (.fxv)

   A) Run the spsm. Begin the run, selecting the base year default control

parameter file and set the output file names to NFLDFXV.

B) Read the include file \spsd\bldfxv.cpi to update the control parameters.

C) Alter the selection facility as follows:

```
SELSPEC     hdprov==NFLD
```

D) Alter the user variable facility parameter as follows:

```
UVARFLAG    1
UVAR        a=1.0/hhnin;
```

E) The variable a is used to correctly duplicate expenditure pattern vectors and should be used instead of fxclohhv in the ASCVARS parameter of the text output facility. Edit ASCVARS as follows:

```
ASCVARS     fxseqhv fxseqhv hdseqhh a
……..
```

F) Read the include file \spsd\bldfxv.api to update the adjustment parameters and then complete the model run.

G) Use bldfxv.exe to create the new FXV file called NFLDYY.FXV.

```
C:\bldfxv nfldfxv.prn nfldyy.fxv
```

3. BUILD DATABASE FILE (.spd)

A) Run the spsm. Begin the run, selecting the base year default control parameter file and set the output file names to NFLDSPD.

B) Read the include file \spsd\bldspd.cpi to update the control parameters.

C) Alter the selection facility as follows:

```
SELSPEC     hdprov==NFLD
```

D) Read the include file \spsd\bldspd.api to update the adjustment parameters and then run the model.

E) Use bldspd.exe to create the new SPD file called NFLDYY.SPD

```
C:\bldspd nfldspd.prn nfldyy.spd
```

4. BUILD AN INCLUDE FILE (.cpi)

A) Create an include file NFLDYY.CPI to replace the SPSD input files INPWGT, INPFXV, INPSPD by the new one just created. This file should have the following statements:

```
INPSPD      nfdlyy.spd
FXVFLAG       1
INPFXV      nfldyy.fxv
WGTFLAG       1
```

INPWGT nfldyy.wgt

When you will run spsm using the new database, just read the include file nfldyy.cpi to update the control parameters to point to the appropriate data files.

WARNING

The results will be slightly different from the full SPSD. This is due to the use of random numbers in calculating GIS take-up rates whatever other take-up rates are used in that model year. Persons will be assigned a different number from the sequence of randoms. If you want to compare the results with the one obtained from the complete database, set GISTURFLAG and any other relevant take-up parameters to zero.

Programming Utilities

GREP

This utility searches all specified files (multiple wildcard file-specs in the current directory are allowed) for a given string and displays lines in which the string is found. Two options are allowed: -n precedes each matching line with its line number and -l just gives a list of file names satisfying the pattern. grep is quite useful as an on-line cross-reference device for perusing source code files or parameter files. For example, if the command

```
C>grep -l capg *.c
```

were given in the \spsm\glass directory, the output, which identifies all modules that refer to capital gains, would look like this:

```
agis.c
amemo1.c
atxcalc.c
atxinet.c
atxitax.c
atxqinet.c
gis.c
memo1.c
txcalc.c
txinet.c
txitax.c
txqinet.c
```

As another example from version 5, if the command

```
C>grep CTCPC *.mpr
```

were issued in the \spsd directory, the output would look like this:

```
ba82.mpr: CTCPC       343.00        # Child tax credit per child
ba84.mpr: CTCPC       367.00        # Child tax credit per child
ba85.mpr: CTCPC       384.00        # Child tax credit per child
ba86.mpr: CTCPC       454.00        # Child tax credit per child
ba87.mpr: CTCPC       489.00        # Child tax credit per child
ba88.mpr: CTCPC       559.00        # Child tax credit per child
ba88y88.mpr: CTCPC     474.06         # Child tax credit per child
```

```
ba89.mpr: CTCPC         565.15          # Child tax credit per child
ba89y88.mpr: CTCPC       460.40           # Child tax credit per child
sq88.mpr: CTCPC         524.00          # Child tax credit per child
sq88y88.mpr: CTCPC       444.38           # Child tax credit per child
```

As can be seen, the value of CTCPC in each tax/transfer parameter file in the \spsd directory is displayed.

SUMSKIP

This is an executable that helps Statistics Canada to verify if you have installed your version of SPSD/M properly or if there is any problem associated with a file.

An example of the command is:

```
C>sumskip  c:\spsd\ba92.mpr
```

This produces an output like the following:

```
skip=194 bytes=135869 checksum=1876377548
```