

Chapter 9

Ancillary software: aggregation programs

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This chapter describes the GTAP data package, and more especially the aggregation program included in the GTAP data package. It is based on user documentation shipped with the package. It may also be of interest to readers considering purchase of the data base.

In the text below, we use some conventions in displaying computer commands. Commands shown thus:

```
unzip csdpmi4b
```

should be entered exactly as shown. In commands shown thus:

```
ViewHAR FILENAME
```

the italicised text should be replaced by suitable user-supplied text (in the example, by a file name).

9.1 System requirements

This package is only for systems running or are compatible with Microsoft (*MS*) DOS 5.0 or Windows 3.1 or higher. At least 15 Megabytes of random access memory must be available (more is recommended). You need 40 megabytes (mb) of available disk space to install the package. After installation, you can trim disk usage to about 25 mb with a clean-up program.

To use the *ViewHAR* header array file viewer, you need MS Windows 3.1 or above.

9.2 *Installing the package*

To install, copy all files and subdirectories from the current directory (`main`) of the CD-ROM to a directory on your hard disk. That will become your GTAP directory.

To test that the package functions correctly on your computer, open a DOS box, change directory to your GTAP directory, and issue the command:

```
test
```

To view a detailed report on the full data base, start the ViewHAR program and open the file `V4VIEW.HAR` (if you do not already have ViewHAR installed, see section 9.3 on installing the copy bundled with this distribution).

`V4VIEW.HAR` has been designed so that viewing it under ViewHAR, you can obtain many useful sums and shares interactively. For details see the ViewHAR on-line help, under the topic *Options for Real Matrices*.

If using the package with plain DOS (i.e., not under MS Windows) you will require a DPMI server. You may have one already; for those who do not, we have included in the package Charles W. Sandmann's freely redistributable DPMI server. To install it,

```
unzip csdpmi4b
```

9.3 *ViewHAR*

The ViewHAR program allows users to navigate and view header array files in a graphical user environment. If you do not already have a copy of ViewHAR, you may wish to install the copy bundled with this package.

To install ViewHAR:

- from a DOS window, change to the ViewHAR subdirectory of your GTAP directory, and enter:

```
install
```

- or, from the Windows 3.1 Program Manager, select the File menu, then the Run command, then enter:

```
GPDIRPATH\ViewHAR\install
```

- or, from the MS Windows 9x or NT "Start" menu, select the Run command, then enter:

```
GPDIRPATH\ViewHAR\install
```

replacing `GPDIRPATH` by the full path name for your GTAP directory.

Once installed, you can run ViewHAR:

- from the command line, typing

```
ViewHAR FILENAME
```

- if you add the ViewHAR directory to your path,
 - (in Windows 9x/NT) from the command line, typing


```
start BASENAME.HAR
```
 - if you create an association between the HAR filename extension and ViewHAR,
 - from the Windows desktop or Start menu, if you put a ViewHAR shortcut there,
 - (in Windows 9x/NT) by double-clicking a HAR file icon, if you create an association between the HAR filename extension and ViewHAR.
- For help on creating filename associations under MS Windows 9x:
- go to Start/Help/Index/1 Type the first few letters . . . ,
 - type creating,
 - goto 2 Click the index entry . . . ,
 - double-click file types.

9.4 *Preparing aggregations*

To prepare an aggregation, you need to prepare an aggregation mapping file and run the aggregation program.

Preparing an aggregation mapping file

To prepare an aggregation mapping file, make a copy of the file INPUT . TEM (see figure 1), and edit it to suit your requirements. For details on layout, see the instructions included in INPUT . TEM itself. For an example of a completed mapping file, see the file TEST335 . TXT. Save the edited file with a name ending in the extension . TXT, for example, MY_AGG . TXT.

Running the aggregation program

The aggregation program is DATA-AGG . BAT. To run it:

- Make the directory with the GTAP data package your current directory. For example, if you have installed the GTAP data package in the directory C:\GTAP, you might enter the command


```
cd C:\GTAP
```
- Invoke the program, using either:
 - syntax 1:


```
DATA-AGG map-file
```
 - or
 - syntax 2:


```
DATA-AGG [map-dir\]map-file [output-dir [work-dir]]
```

Figure 9.1. Template File for the 3x3 Aggregation!

```

!      AGGREGATION TEMPLATE FOR GTAP DATABASE VERSION 4
!                                     (18-Jun-98 BD)
!
!  NOTES:
!
!      a. All lines starting with ! are ignored.
!
!      b. Empty lines are also ignored.
!
!      c. Ampersands "&" are used to separate "fields."
!
!      d. The lines starting "= = =" denote start and end of
!          aggregation sections.
!
!      e. In sections 1. and 3., a number of lines to be
!          filled in are provided. Additional lines can be
!          added as needed. Unused lines should be removed.
!
!      f. In the sample lines included below, the columns
!          to be filled in are indicated with a number of
!          carats "^" below the relevant part of the line.
!
!      g. Names for aggregated commodities/regions/factors can
!          include 12 characters. This can include letters, digits
!          and the characters @ and _. The first character in the
!          name must be a letter.
!
!  Send comments on the use of this form to dimaranan@agecon.purdue.edu
!
!
!  1. AGGREGATED COMMODITIES
!
!      In this section, the user fills in:
!
!          a) short names
!          b) (optional) explanatory text
!
!      Please note that in this section additional lines
!      can be added as needed and unused lines should be
!      removed.
!
!
!      Sample line follows:
!
!  AGR      & Food and Ag Includes onion pizzas
!  ^^^      ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

```

```

!
!   NAME      |   Explanatory Text
!             |   (Rest of line)
! (<=12 char) |   ( Optional )
=====
&
&
&
&
&
&
&
&
&
&
=====
!
! 2. COMMODITY AGGREGATION MAPPING
!
!   In this section the user fills in the short name of
!   the appropriate aggregated commodity (from the previous
!   list) for each GTAP commodity.
!
!   Sample line follows:
!
! pdr, paddy rice                                & AGR
!                                                ^^^
!
!               GTAP COMMODITY                    | Aggregated
!               |                               | Commodity
! * * * * * DO NOT CHANGE THIS COLUMN * * * * * | (NAME)
=====
pdr, Paddy rice                                &
wht, Wheat                                    &
gro, Cereal grains nec                        &
v_f, Vegetables, fruit, nuts                 &
osd, Oil seeds                               &
c_b, Sugar cane, sugar beet                  &
pfb, Plant-based fibers                      &
ocr, Crops nec                              &
ctl, Bovine cattle, sheep and goats, horses &
oap, Animal products nec                    &
rmk, Raw milk                              &
wol, Wool silk-worm cocoons                 &
for, Forestry                              &
fsh, Fishing                                &
col, Coal                                    &

```

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oil, Oil	&
gas, Gas	&
omn, Minerals nec	&
cmt, Bovine cattle, sheep and goat, horse meat prods	&
omt, Meat products nec	&
vol, Vegetable oils and fats	&
mil, Dairy products	&
pcr, Processed rice	&
sgr, Sugar	&
ofd, Food products nec	&
b_t, Beverages and tobacco products	&
tex, Textiles	&
wap, Wearing apparel	&
lea, Leather products	&
lum, Wood products	&
ppp, Paper products, publishing	&
p_c, Petroleum, coal products	&
crp, Chemical, rubber, plastic products	&
nmm, Mineral products nec	&
i_s, Ferrous metals	&
nfm, Metals nec	&
fmp, Metal products	&
mvh, Motor vehicles and parts	&
otn, Transport equipment nec	&
ele, Electronic equipment	&
ome, Machinery and equipment nec	&
omf, Manufactures nec	&
ely, Electricity	&
gdt, Gas manufacture, distribution	&
wtr, Water	&
cns, Construction	&
t_t, Trade, transport	&
osp, Financial, business, recreational services	&
osg, Public admin and defence, education, health	&
dwe, Dwellings	&

= = = = =

!

! 3. AGGREGATED REGIONS

!

! In this section, the user fills in:

!

! a) NAMES

! b) (optional) explanatory text

!

! Please note that in this section additional lines
! can be added as needed and unused lines should be
! removed.

```

!
!
! Sample line follows:
!
!  LOW   &  Low Income (GNP per capita under 2,000)
!  ^^^          ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
!
!          |      Explanatory Text
!  NAME    |      (Rest of line)
!(<=12 char)|      ( Optional )
=====
          &
          &
          &
          &
          &
          &
          &
          &
          &
          &
=====
!
! 4. REGIONAL AGGREGATION MAPPING
!
!  In this section, the user fills in the short
!  name for the aggregated region to which each
!  of the GTAP regions belong.
!
!  Sample line follows:
!
!  IDN      Indonesia                & LOW
!                                     ^^^
!          GTAP REGION                | Aggregated
!                                     |   Region
! * * DO NOT CHANGE THESE COLUMNS * * | (NAME)
=====
AUS      Australia                &
NZL      New Zealand              &
JPN      Japan                    &
KOR      Republic of Korea        &
IDN      Indonesia                &
MYS      Malaysia                  &
PHL      Philippines              &
SGP      Singapore                &
THA      Thailand                  &
VNM      Viet Nam                  &

```

CHN	China	&
HKG	Hong Kong	&
TWN	Taiwan	&
IND	India	&
LKA	Sri Lanka	&
RAS	Rest of South Asia	&
CAN	Canada	&
USA	United States of America	&
MEX	Mexico	&
CAM	Central America and Caribbean	&
VEN	Venezuela	&
COL	Colombia	&
RAP	Rest of Andean Pact	&
ARG	Argentina	&
BRA	Brazil	&
CHL	Chile	&
URY	Uruguay	&
RSM	Rest of South America	&
GBR	United Kingdom	&
DEU	Germany	&
DNK	Denmark	&
SWE	Sweden	&
FIN	Finland	&
REU	Rest of European Union	&
EFT	European Free Trade Area	&
CEA	Central European Associates	&
FSU	Former Soviet Union	&
TUR	Turkey	&
RME	Rest of Middle East	&
MAR	Morocco	&
RNF	Rest of North Africa	&
SAF	South African Customs Union	&
RSA	Rest of Southern Africa	&
RSS	Rest of Sub Saharan Africa	&
ROW	Rest of World	&

= = = = =

!

! 5. AGGREGATED ENDOWMENTS

!

! In this section, the default endowment aggregation for GTAP
! Version 4 has been specified. Users may change the aggregation
! following these rules:

- ! a) One of the aggregated endowment names should be "capital"
- ! since this plays a key role in the GTAP model.
- ! b) Specify the classification of the aggregated factor,
- ! whether sluggish or mobile. There should be at least one
- ! sluggish and at least one mobile factor.

```

!           c) Specify the value of the elasticity of transformation,
!           etrae, for each aggregated sluggish endowment.
!
!
!           | Sluggish   | etrae for   | Explanatory Text
! NAME      | or Mobile    | sluggish    | (Optional)
=====
Land        & sluggish & -1.000     & land
UnSkLab     & mobile  & ---       & unskilled labor
SkLab       & mobile  & ---       & skilled labor
Capital     & mobile  & ---       & capital
NatRes      & sluggish & -0.001    & natural resource
=====
!
! 6. ENDOWMENT AGGREGATION MAPPING
!
! In this section, the user fills in the short
! name for the aggregated endowment to which each
! of the GTAP endowments belong. The default settings
! are in place.
!
!
!           GTAP FACTOR           | Aggregated
!                               | Factor
! * * DO NOT CHANGE THESE COLUMNS * * | (NAME)
=====
LAN    Land          & Land
ULA    UnSkLab       & UnSkLab
SLA    SkLab         & SkLab
CAP    Capital       & Capital
NTR    NatRes        & NatRes
=====

```

Note:

- For *map-file* substitute the name of your aggregation mapping file, omitting the extension .TXT. For example, if your mapping file is MY_AGG.TXT, substitute MY_AGG for *map-file*.
- To use syntax 1, your mapping file must be in the same directory as the GTAP data package. With syntax 2 you can specify the location of your mapping file, the aggregated data files and intermediate files. You exercise this control through the optional arguments shown in square brackets. (Don't type the brackets in your command line; they're just there to indicate that the arguments are optional.) Substitute as follows:
 - map-dir* the directory containing your mapping file,
 - output-dir* the directory to contain the aggregated data files,
 - work-dir* the directory to contain all intermediate working files.

For example, to use a mapping file MY_AGG.TXT in the directory C:\MY_APP, writing the aggregated data files to C:\MY_APP\DAT, and the working files to C:\MY_APP\TEMP, enter

```
data-agg C:\MY_APP\MY_AGG C:\MY_APP\DAT C:\MY_APP\TEMP
```

- Besides the aggregated data files, the program will create a report file GVIEW.HAR containing summary information on the data base. To inspect this file we recommend the ViewHAR utility, bundled with GEMPACK and with this GTAP distribution.
- At the user's option, the program will also
 - convert the aggregated data file to the GEMPACK 5.1 real array format (this is useful for users of GEMPACK version 5.1 or lower), and
 - calculate GE elasticities of demand.

Further details:

- With syntax 1, the program behaves as in GTAP release 2.
 - The program will look in the GTAP data package directory for a mapping file with the extension .TXT.
 - It will create a subdirectory with the same base name as your mapping file. For example, if your mapping file is MY_AGG.TXT, it will create a subdirectory MY_AGG.
 - It will write the aggregated data files GSET.HAR, GPAR.DAT and GDAT.HAR to the new subdirectory.
 - It will leave intermediate working files in the current directory.
- After running an aggregation with syntax 1, you can remove intermediate files from your GTAP directory with the command:


```
aggclean
```
- With syntax 2, the program behaves as follows:
 - It looks for the mapping file in the directory indicated by the argument *map-dir*. If you do not supply a value for *map-dir*, it looks in the GTAP data package directory.
 - It writes the aggregated data files GSET.HAR to the directory indicated by *output-dir*. If you do not supply a directory for *output-dir*, it writes the files to the GTAP data package directory.
 - It writes intermediate working files to the directory indicated by *work-dir*. If you do not supply a value for *work-dir*, it writes the working files to the same directory as the aggregated data files.

Trouble shooting

error message “environment space insufficient”

In MS Windows 9x or NT, you can increase your environment space as follows:

- Open a DOS window.
- Press Alt + Spacebar

- A drop-down menu appears. Press P (for "Properties").
- A dialogue box *COMMAND Properties* appears. Press twice to select the *Memory* page. Press Alt+V to select the *Initial environment* text box.
- Enter a new environment size (2048 should be adequate for most users).
- Press Enter to exit (*sic*).

error message "error in MAP file"

This message can be generated by an error in your mapping file.

An error describing the error in the mapping file may be found in the intermediate working file *gmap.txt*. This is in the main GTAP directory, if you used syntax 1, or in your selected work directory, if you used syntax 2. See also below under the heading "Mapping file errors".

error message "user-specified directory or file does not exist"

This message is written if the program cannot find the mapping file (syntax 1 and 2), or if it cannot find the output or work directories (syntax 2 only).

One way to generate this error is to include the extension *.TXT* in the *map-file* parameter. For example, the command

data-agg MY_AGG.TXT

Wrong!

would generate this error.

Mapping file errors

(This is taken from earlier documentation by Randy Wigle.)

The following error checks are made on the input map (the *.TXT* file.)

- If an aggregated commodity is referred to in section 2 of the mapping, but it has not been defined in section 1, an error is noted on the first occurrence and the program exits.
- If an aggregated region is referred to in section 4 of the mapping, but it has not been defined in section 3, an error is noted on the first occurrence and the program exits.
- If a line or section of the file is not set up properly, an error is noted and the current line is printed. Note that this will not always be the incorrect line. In particular, if you leave out one of the "*= = =*" lines, the line where the error prints will usually be later in the file.
- If an aggregated commodity is duplicated in section 1, an error will be generated, but the program usually chokes in section 3 (it is finding two matching aggregated commodities for one disaggregated commodity.)
- If an aggregated commodity or region name violates GEMPACK rules (e.g. if it is longer than 12 characters, or if it includes characters other than letters, digits and underscores, or if it doesn't start with a letter), then an error will be generated and the program terminates. See the discussion in the file *INPUT.TEM*.

9.5 *GEMPACK version issues*

The package contains several TABLO-generated programs, compiled at Purdue, using a beta test release of GEMPACK 6.0. We are grateful to Ken Pearson and the Center of Policy Studies for granting permission for us to distribute these executables. That permission given, it should be understood that the decision to use the GEMPACK 6 beta release, rather than an earlier release, was ours not theirs.

We opted to use GEMPACK 6.0 because it generates executables that work with models of all sizes, subject only to the user's computer's capacity and to a licence restriction described below. We judged that this outweighed the slightly increased risk of using beta-test software. In our testing, we have found no problems with the executables distributed in this package.

The GEMPACK 6.0 executables have the capacity to work with models of all sizes, but by design they will not always do so. They incorporate licencing restrictions such that with large models, they will refuse to run unless the user has a GEMPACK source-code licence or large-simulations licence. GEMPACK Document No. GPD-1 has further details.

This does not prevent GTAP subscribers from using the aggregation program to create aggregations of any size. Users can also generate the GE elasticity results, provided that the aggregation is small (10x10 or smaller), or you have a GEMPACK source-code or large-simulations licence. To get the elasticity results for a large aggregation, however, you need a GEMPACK source-code or large-simulations licence.

9.6 *Legalese*

As always, to the extent permitted by applicable law, THE GTAP PACKAGE COMES WITH ABSOLUTELY NO WARRANTY.

9.7 Contents

Unpacked, the distribution contains the following files:

user information

README	this file
V4VIEW.HAR	data base report, designed for use with ViewHAR

GTAP data base version 4 release

gsddat.har
gsdpar.dat
gsdset.har

bundled freeware

A number of programs from outside sources are needed for unpacking and aggregating the data base:

awk.exe	from Gnuish Project, text processing language
MODHAR.EXE	from COPS/IMPACT, modifies HAR files
RWHAR.EXE	from COPS/IMPACT, converts 5.2- to 5.1-style HAR files
unzip.exe	from Info-ZIP, extracts compressed files
UUDECODE.EXE	from Richard Marks, restores uuencoded files
csdpmi4b.zip	from Charles Sandmann, DPMI server

In accordance with the licences for awk and unzip (see doc\copying.*), we offer program source code on request to purchasers of the data package, within three years of the original purchase, charging for distribution only. More conveniently, however, users seeking documentation and source code can obtain it through the sites from which we obtained the executables:

awk.exe	http://www.dms.auburn.edu/gnuish/
unzip.exe	http://www.cdrom.com/pub/infozip/

These programs should run with all reasonably current versions of MS-DOS and MS-Windows (and most less-than-reasonably current); if nevertheless you do encounter problems, please advise us (see *Contact* below).

aggregation mapping files

Some files are included to assist you in specifying mappings for data base aggregations (see further section 4 below):

INPUT . TEM	template for aggregation mapping files
TEST335 . TXT	sample aggregation mapping file

aggregation program

The aggregation program lets you reduce the size of the data base by aggregating across sectors and regions. At the user's option, it also calculates and decomposes general equilibrium elasticities of demand. For user instructions, see section 4.

AGGDAT . ?X?
 AGGMAP . AWK
 AGGPARG . ?X?
 ALLDONE . MSG
 CHOICE . AWK
 DATA-AGG . BAT
 ELGA0 . CMF
 ELGC0 . CMF
 EVSS . AWK
 ENVSPCER . MSG
 ERR_EXIT . MSG
 G_USAGE . MSG
 GBARUN . BAT
 GSET . PRE
 MAPERROR . MSG
 NODIR . MSG
 NOTBASE . AWK
 NUM0 . CMF
 PP . AWK
 PREDIM . AWK
 PREEND . AWK
 PREETR . AWK
 PREMEN . AWK
 PREREG . AWK
 PRESEC . AWK
 PRESEN . AWK
 PRICELAS . ?X?
 TPGTAP . ?X?

miscellaneous files

AGGCLEAN.BAT	cleans up after an aggregation run
DACHECK. ?X?	for test program, validates aggregated data base
GETVER.AWK	for test program, gets operating system version
GTAPVIEW. ?X?	display summary information from GTAP data base
TEST. *	test the installation
unpack.bat	unpacks this distribution
UPKCLEAN.BAT	cleans up after unpacking
VIEWFULL.STI	for GTAPVIEW, to make report on full data base
TSTTGT*	for test program, aggregated data base

additional documentation

DOC\COPYING.AWK	copyright notice for awk
DOC\COPYING.UZP	copyright notice for unzip
DOC*_MAP.TXT	sectoral mapping for contributed IO table for region *; provided for regions with incomplete sectoral detail (25 regions)

source files for aggregation program

SOURCE\AGGDAT.TAB
 SOURCE\AGGPARG.TAB
 SOURCE\DACHECK.TAB
 SOURCE\GTAPVIEW.TAB
 SOURCE\PRICELAS.TAB

GTAP model

MODEL\GTAP.TAB	solution program
MODEL\NUM3X3.CMF	sample command file for solution program
MODEL\TP1010.STI	for TABLO, to make Fortran/GEMSIM files

ViewHAR

ViewHAR is an MS-Windows utility for viewing GEMPACK header array files, developed by Mark Horridge at the Centre of Policy Studies, Monash University, bundled with recent GEMPACK distributions.

ViewHAR\INSTALL.EXE
 ViewHAR\VIEWHAR.CN_
 ViewHAR\VIEWHAR.EX_
 ViewHAR\VIEWHAR.HL_

ViewHAR\VIEWHAR2.DO_
ViewHAR\WINSTALL.INF
ViewHAR\WINSTALL.TXT

The version provided here is the 16-bit flavor of version 2.5, dated June 1998. It is suitable for use with Windows 3.11 and above and Windows NT. To install, just run ViewHAR\INSTALL.EXE. Users with Windows 95 or above or Windows NT may prefer the 32-bit version, obtainable from

<http://www.monash.edu.au/policy/gpmark.htm>

9.8. *Contact*

If you experience problems with this package that you cannot resolve by reference to the documentation, please contact us by email at gtap@ftp.purdue.edu.