Plenary session I
MAMS: File structure and How to Run it in GAMS

Hans Lofgren
World Bank

Second Training Workshop for the UN/DESA – UNDP – World Bank Project "Realizing the MDGs Through Socially Inclusive Macroeconomic Policies in Africa", held at "Limpopo" The Farm Inn, Pretoria, South Africa, May 10-13, 2010

.

Outline

1. Standard models – some observations
2. MAMS file structure
3. Batch files to run the system
4. How to proceed

1. Standard models

- Separation between model code and database:
  - a generic set of model files in GAMS
  - application-specific files (almost entirely in Excel) for data and simulations
  - anything that is not specific to a database should appear in the model code (if you want to correct an error, you only need to do it once)

Standard models

- Model code is written to capture what is found in each database:
  - flexible (dis)aggregation
  - alternatives specified for selected assumptions:
    - closure rules for macro balances and factor markets;
    - rules for selected spending items (government and non-government) (at least for the MAMS case).

Standard models

- Model code includes:
  - pre-programmed reports of simulation results.
  - error diagnostics (pinpointing errors in the database and simulations
  - SAM balancing program (to remove minor imbalances exceeding some small cut-off)
  - aggregation code

2. MAMS file structure

- Two model versions:
  - MDG (used in this project)
  - core (excludes module for MDGs and education + links between education and labor market)
  - ✓ Some application files apply only to one of the two versions; some apply to both.
- The major file segments are:
  a. Data and base run
  b. Simulations
  c. Reports

MAMS file structure

a. Data and base run

- *data1.gms* and *data2.gms* -- read in data. Key include files:
  - *app-general-data.xls* – data for both MAMS versions
  - *app-mdg-data.xls* – data only needed for MDG version
- *mod.gms* (restart from *data2.gms*) – the reference (base) run. Key include files:
  - *diagnostics-data.inc* -- catches errors in the database.
  - *diagnostics-sol.inc* -- checks/debugs the base solution
  - *reploop.inc* -- collects results for reports

MAMS file structure

b. Simulations

- *sim.gms* (restart from *mod.gms*) – simulations for analysis. Read in data from:
  - *app-core-sim.xls* – for core version: specifies non-base simulation assumptions/parameters.
  - *app-mdg-sim.xls* – for MDG version: specifies non-base simulation assumptions/parameters.
  - *reploop.inc* – collects results for reports

MAMS file structure

c. Reports

- *rep.gms* (restart from *sim.gms*) – processes raw simulation results. Key include files:
  - *rep*.inc* (various include files) -- computes growth rates, GDP shares, defining standard tables, etc.
- *repmacro.gms* (restart from *rep.gms*) – produces standard macro tables, exported to the file *repmacro.xls*
- *repmeso.gms* (restart from *repmacro.gms*) – produces standard meso (sectorally disaggregated) tables, exported to the file *repmeso.xls*

MAMS file structure

- Built-in poverty module (reppov.gms, restart from repmeso.gms) not used in this project.
- Ways of using the system (files to change):
  a. Analysis with existing data set:
     - new (adjusted) files *app-core-sim.xls* or *app-mdg-sim.xls.*
  b. Analysis with new data set:
     - same as (a) + new files *app-general-data.xls* and *app-mdg-data.xls* (the latter only if MDG application);
  c. Analysis with new data set and changed model:
     - same as (b) + changes in selected GAMS files.

3. Batch files for MDG version

Batch file	Restarts from	File(s) it runs	Description
Running MAMS step by step:			
rd-app-mdg.bat		data1.gms data2.gms	creates database
rm.bat	data2.gms	mod.gms	defines model items (sets and parameters) and runs base simulation
rs-app-mdg.bat	mod.gms	sim.gms	runs application simulations
rr.bat	sim.gms	rep.gms	generates reports with simulation results
rrepmacro.bat	rep.gms	repmacro.gms	generates standard macro tables
rrepmeso.bat	repmacro.gms	repmeso.gms	generates standard meso tables
Running MAMS in one or two steps			
1-app-mdg.bat		rd-app-mdg.bat rm.bat	see above
2-app-mdg.bat		rs-app-mdg.bat rr.bat rrepmacro.bat rrepmeso.bat rreppov.bat	see above
12-app-mdg.bat		1-app-mdg.bat 2-app-mdg.bat	see above

Batch files to run the system

- To run the core version instead of the MDG, replace “mdg” by “core” in all of these batch commands.
- Batch files for “cleaning”:
  a. clean1.bat: deletes superfluous, automatically generated files
  b. clean2.bat: empties the *save* directory
  c. clean12.bat: runs (a) and (b).

Batch files to run the system

- Main advantage of batch files: time-saving – no need to run each of the 7 file segments separately (as in GAMS-IDE).
- Inspection of .LST files permits you to see where something went wrong.

How to run batch files

- Open GAMS-IDE.
- Open the MAMS project in GAMS-IDE.
- Click on the MS-DOS button (top right of the GAMS-IDE window).
- Enter the name of the batch files (without the *.bat* extension) in the DOS window.
- Hit “Enter”.

4. How to proceed

- Each team receives a zip file with MAMS-in-GAMS including a “demo” application.
- Steps:
  a. Unzip in a new devoted directory.
  b. Copy all files with **demo*.** to **app*.** where *app* = the short name for your country application: *sa, uga, sen*.
  c. Open all files **app-*.bat* and do a global search-replace: **demo-** ➔ **app-**

How to proceed

d. Do test runs of *demo* and your new *app* using batch files (*1-demo-mdg.bat, 2-demo-mdg.bat, 1-app-mdg.bat, 2-app-mdg.bat*).
e. “Synchronize” the files *app-general.data.xls* and *app-mdg-data.xls*.
f. Run *rd-app-core.bat* and *rm.bat* when *app-general-data.xls* is ready; debug if needed.
g. Run *rd-app-mdg.bat* and *rm.bat* when also *app-mdg-data.xls* is ready; debug if needed.

How to proceed

h. Run *rs-app-mdg.bat* (only for the base scenario), *rr.bat*, *rrepmacro.bat*, and *rrepmeso.bat*. Debug if needed.

i. Inspect the results to fine-tune the reference scenario (by adjusting *app-general-data.xls* and/or *app-general-mdg.xls*) and/or the base scenario (by adjusting *app-mdg-sim.xls*).

j. Define and analyze non-base scenarios (in *app-mdg-sim.xls*). Debug and adjust (going back to preceding steps if needed).

How to proceed

- For more resources on MAMS, visit: www.worldbank.org/mams