

# Aggregating Input-Output Table in GAMS: Accounting for Changes in Sectoral Aggregation

Erwin L. Corong<sup>1</sup>  
April 2007

IO tables vary in sizes, and often one needs to aggregate them. However, aggregating an IO table is a painstaking task as one has to reduce corresponding row and columns at a time—i.e., establish a one to one column and row reduction between the IO table’s Standard Industrial classification (SIC) code to that of intermediate demand, intermediate input, value added and final demand.

This document is an extension of Corong (2007b) and demonstrates a way to mechanize the aggregation of IO tables in GAMS (General Algebraic Modeling System software) as a result of changes in sectoral aggregation. Although aggregation can be done in any spreadsheet software like Excel, using GAMS allow researchers to save time and minimize data mishandling errors. As will be shown below, any changes in sectoral aggregation would simply involve minor changes in the GAMS code “*Input\_output\_1.gms*”. To avoid repetition, this note will simply point out the changes that have to be made.

## 1. Set Declaration and Mapping

Box 1 shows the set declaration used in the GAMS code.

### Box 1: Declaration of sets (IO Accounts)

```

SET
n      Numeric Labels      /      1*20      /
i      Sectors              /      AGRI      Agriculture, Fishery and Forestry
                        MNQG      Mining and Quarrying
                        MFNG      Manufacturing
                        CONS      Construction
                        EGWA      Electricity, Gas and Water
                        TRCS      Transport and Communications
                        WRTR      Wholesale and Retail Trade
                        FINA      Finance
                        REAL      Real Estate
                        PSER      Private Services
                        GSER      Government Services      /
fd     Final Demand        /      PCE      Personal Consumption Expenditure
                        GGCE      General Government Consumption Expenditure
                        GFCF      Gross Fixed Capital Formation
                        CHST      Changes in Stocks
                        EXPO      Exports
                        IMPO      Imports      /
va     Value Added         /      COMP      Compensation
                        DEPR      Depreciation
                        ITXN      Indirect Taxes-Subsidies
                        OPSU      Operating Surplus      /
mapl(n,i) mapping numeric labels to sectors
                        /      1. AGRI
                        2. MNQG
                        3. MFNG
                        4. CONS
                        5. EGWA
                        6. TRCS
                        7. WRTR
                        8. FINA
                        9. REAL
                        10. PSER
                        11. GSER      /
mapva(n,va) mapping numeric labels to value added
                        /      13. COMP
                        14. DEPR
                        15. ITXN
                        16. OPSU      /
mapfd(n,fd) mapping numeric labels to final demands
                        /      13. PCE
                        14. GGCE
                        15. GFCF
                        16. CHST
                        17. EXPO
                        18. IMPO      /

```

<sup>1</sup> Please send comments to [erwincorong@gmail.com](mailto:erwincorong@gmail.com) This note greatly benefited from Jesper Jensen’s lecture on aggregating input-output table using GAMS/GDX during his GAMS-MPS/GE training course. The codes used in this exercise is a modified version of the one presented during the training. The usual disclaimer applies.

## 2. Aggregation Mapping

Box 2 and 3 shows the aggregation maps for “*Input\_Output\_1.gms*” and “*Input\_Output\_2.gms*” respectively. The former is the GAMS code from Corong (2007b) while the latter is the new GAMS code as a result of changes in IO aggregation. Aggregation mapping involves matching the sectoral set I defined in Box 1, with a set of sectoral classifications in Box 2 or 3 [*set g* and *set map(\*,\*)*] in order to effectively carry out the desired sectoral aggregation process.

Notably, any changes in sectoral aggregation simply entail two successive modifications in the file “*Input\_Output\_1.gms*”. By comparing Box 2 and 3 one can see the following changes: (1) modification of set *g* to account for the changes in sectoral classification—from 3 to 6 sectors; (2) modification of the set *Map(\*,\*)* which matches each set belonging to I with that of *g*.

### Box 2: Declaration of sets (Aggregation Maps-“*Input\_Output\_1.gms*” )

SET			
G	Sectoral Classifications	/	AGR      Agriculture MFG      Manufacturing PSE      Private Services GSE      Government or Public Services
			/
map(*,*)	mapping individual industry to sectoral classifications	/	AGRI.AGR MNQG.MFG MFNG.MFG CONS.PSE EGWA.PSE TRCS.PSE WRTR.PSE FINA.PSE REAL.PSE PSER.PSE GSER.GSE
			/

### Box 2: Declaration of sets (Aggregation Maps-“*Input\_Output\_1.gms*” )

SET			
G	Sectoral Classifications	/	AGR      Agriculture MFG      Manufacturing PSE      Private Services UTI      Utilities and transport and communications WTR      Wholesale and Retail Trade OSE      Other Services GSE      Government or Public Services
			/
map(*,*)	mapping individual industry to sectoral classifications	/	AGRI.AGR MNQG.MFG MFNG.MFG CONS.PSE EGWA.UTI TRCS.UTI WRTR.WTR FINA.PSE REAL.PSE PSER.PSE GSER.GSE
			/

## References

- Corong, Erwin (2007a). “*Input\_Output\_2.gms: The accompanying GAMS code for the note—Aggregating Input-Output Table in GAMS: Accounting for Changes in Sectoral Aggregation*”. Poverty and Economic Policy (PEP) Research Network. Available at [www.pep-net.org](http://www.pep-net.org)
- Corong, Erwin (2007b). “*Aggregating Input-Output Table in GAMS*”. Poverty and Economic Policy (PEP) Research Network. Available at [www.pep-net.org](http://www.pep-net.org)
- GAMS Development Corporation (2006). “*GAMS GDX facilities and tools*”. Washington, D.C., USA.  
GAMS website: [www.gams.com](http://www.gams.com)
- Jensen, Jesper (2005). “*Lecture on: Aggregating input-output tables using GDX*”. Introduction to CGE modeling using GAMS and MPS/GE. Essen, Germany.  
Jesper Jensen’s website: [www.tecatraining.dk](http://www.tecatraining.dk)
- Rutherford, Thomas (2003). “*A GAMS program which maps social accounting data into labeled submatrices*”. University of Colorado, Boulder Colorado, USA.  
Available at [www.mpsge.org](http://www.mpsge.org)