# HANDS-ON COMPUTING WITH ORANIG: PART A
# INTERROGATING THE DATA

## Getting Started with ORANIG

Click on **WinGEM** to start WinGEM, the Windows version of GEMPACK. This should give a narrow menu across the top of the screen:

## Setting the Directory for Model ORANIG

To keep all examples files for this model together in one area, we have created a separate directory called ORANIG on your C: drive. First choose

***File | Change both default directories***

In the file selection box, choose drive **C**: and subdirectory **C:\GPWork\ORANIG**

## TABLO Input file for ORANIG

Choose ***File | Edit*** and open the TABLO Input file **ORANIG.TAB**. You will need to refer to both the TABLO Input file and the data file for ORANIG to answer the following questions because the sets in the TABLO Input file are read from the data file. For example, the set of commodities is read from the Header array called "COM".

## Looking directly at the Data file for ORANIG

There is one data file associated with ORANIG, a Header Array file called **BASEDATA.HAR**.

Use ViewHAR to look at this file. You can access ViewHAR by choosing the menu item on the WinGEM main menu: ***HA*** Files.

**Questions**

1. Which Header contains the set of industries?
   How many commodities are there, and how many industries?

2. How many margins commodities are there? Which commodities are they?

3. What does the Header "ITEX" contain? What is the name of the set containing individual exports? What are the individual export commodities?

4. What are the names of the COEFFICIENTs used in ORANIG.TAB to represent the Armington elasticities? From what Headers are their values read?

5. Look at the values used for the SIGMA1 Armington elasticities? What do these parameters represent? Which products have the highest elasticities? Which have the lowest? Why?

6. What is the value at basic prices of household consumption of imports of commodity "Automoveis"? What is the value of household consumption of domestically-produced commodity "Automoveis"?

7. What is the value of capital rental for industry "SIUP"?

8. What is the value at basic prices of the intermediate input of domestically produced commodity "SIUP" to production in industry "Minerio" ?

Note: ViewHAR can only view two dimensions at a time. Use one of the little boxes at top right for aggregating matrices in different dimensions and choose " SIUP" for the COM dimension. See the ViewHAR help under "Options for real matrices" for more details.

## Consequences of the data

You will also need to look at consequences of the data (for example, totals and shares calculated from the data which is read in).

The main TABLO Input file **ORANIG.TAB** can be used for this purpose. As well as solving the model, it writes out various useful data calculated from the original data to a SUMMARY file. You can use GEMSIM to produce this file without actually performing a simulation.

Look at ORANIG.TAB in the editor ( ***File | Edit...***). Search for "summary".
To produce the SUMMARY file proceed as follows. Choose

***Simulation | TABLO Implement***

The TABLO window appears: click the ***Options*** item in *this* window, and choose

***Run from STI***.

Then use the ***Select*** button to choose the file **ORANIG.STI**. [This file contains instructions for 'condensation', which we explain later.]

Click the ***Run*** button to run TABLO.

Then ***Go to GEMSIM***... and ***Select*** the Command file **FORMULAS.CMF**.

Then ***Run*** GEMSIM. This GEMSIM run will read all the data, calculate all coefficients, and write the summary data.

Once the run has finished, press the button ***View Input/Output files*** to see the name of the data file read in and also the name of the SUMMARY file which is created by GEMSIM.
Use ViewHAR to examine the summary file. You can answer the questions below by examining ORANIG.TAB, BASEDATA.HAR, and SUMMARY.HAR.

Later you will add statements to ORANIG.TAB to compute and write more data to SUMMARY.HAR. These will be used to answer more questions.

## Questions

Most of the following questions can be answered by examining SUMMARY.HAR. Each data item there has a descriptive "long name". Look first in the TAB file to find

- the correct name of the COEFFICIENT
- how each item was calculated (and whether it is really what you want to find out)
- the Header used in writing this COEFFICIENT to file SUMMARY.
- Then look in SUMMARY.HAR in ViewHAR to find the Header and double-click on it to see the values.
- ViewHAR options: You can get ViewHAR to show the name of the Coefficient by selecting *File | Options* and then clicking on the box *Show coefficient names.*
  Another good idea is to select *File | Use advanced editing menu* rather than *Use simplified, read-only menu.*

Headers CSTM and FACT are useful for the next two questions:

9. The COEFFICIENT used for the total labour bill in industry "i" is V1LAB_O(i).
   (a) What COEFFICIENT is used for the total cost in industry "i" (plus tax)? V1TOT
   (b) What COEFFICIENT is used for the total factor input to industry "i"? V1PRIM
   (c) What are the calculated values of these three coefficients for industry "ProdConstCiv"?
   (d) What is the share of labour in the total costs of industry "ProdConstCiv" ?

10. (a) What is the total payments to labour summed over all industries (V1LAB_IO)?
    (b) What is the total primary factor payments for all industries? (V1PRIM_I)
    (c) What is the share of labour in total factor cost for all industries?

11. What is the value at purchasers prices of exports of domestically-produced commodity "Metais"?

| | | |
|---|---|---|
| Hints | what COEFFICIENT is this? | V4PUR |
| | what set element do you need to look up? | V4PUR("Metais") |
| | then what header on file SUMMARY | "4PUR" |

12. What is the different between the Coefficients SALE, SALES and DOMSALES? What is the value at basic prices of total sales of domestically-produced commodity "SIUP"?

13. Which header in SUMMARY.HAR tells us about Sales structure? Look at the Sales shares. Which industry sells the highest fraction of its output to investment? After that, which is second highest? Explain.

14. Look at the header CSTM in SUMMARY.HAR which tells us about Cost structure.
    What is unusual about the cost structure of " AlugImoveis"?
    What does the production of this industry represent?

15. The header MSHR in SUMMARY.HAR shows the import penetration for each commodity:
    ratio of (sales of imported good)/(total domestic sales of domestic+imported good)

    Look at the Formula for IMPSHR in the ORANIG.TAB file.

    Which commodity has the highest import penetration[1]?

16. Which header shows the share of exports of commodity c in total export earnings. (Use the value at purchasers' prices.) What commodity has the greatest share? Hint: use the "column" share" feature in ViewHAR.

[1] Once you are skilled, two buttons at top left help you answer “which is greater” questions: the green Sparse Sorted and yellow Transpose buttons.

**17.** Use the header SALE to see the ratio of export sales to total sales of domestically-produced commodity c (using basic prices). Which commodities export more than 50 percent of the value produced? Which commodities are not exported?

**GDP questions**

18. Are the values of Nominal GDP from the income and expenditure sides equal?

19. Nominal GDP from the expenditure side is often given by the formula

GDP = C + I + G + X - M

where C is Consumption, I is Investment, G is Government, X is Exports, M is Imports.

What COEFFICIENT names are used for C, I, G, X and M in the ORANIG TABLO Input file? Find the values of all these quantities and verify whether the above formula is correct.
(Hint: Textbook definitions of GDP often ignore inventories.)

Fill in the following list of values: (Try header "EMAC".)

| | Coefficient Name (in TAB file) | Value (in Summary file) |
|---|---|---|
| C | = | = |
| I | = | = |
| G | = | = |
| X | = | = |
| -M | = | = |
| Stocks | = | = |
| GDP | = | = |

20. Nominal GDP from the income side is given by the formula

V0GDPINC = V1PRIM_I + V0TAX_CSI

What do V1PRIM_I and V0TAX_CSI represent? Fill in the following list of values :

| | |
|---|---|
| V1PRIM_I | = |
| V1LND | = |
| V1LAB_IO | = |
| V1CAP_I | = |
| V0TAX_CSI | = |
| V0GDPINC | = |

## Adding more statements to ORANIG.TAB

21. What is the value at purchasers' prices of the intermediate input of domestically-produced commodity Animais to production in the ProdAnimalindustry ?

    (First what COEFFICIENT is this? What set elements are you looking for - for example the set element for the commodity is "Animais".)

To answer this, you will need to add a **WRITE** statement to the TABLO Input file ORANIG.TAB to report a COEFFICIENT calculated by FORMULA. It will appear in file SUMMARY.HAR.

Right at the end of the TAB file, add the WRITE statement:

```
Write
????? to file SUMMARY header "PUR1" longname "Intermediate purch. value";
```

Replace ????? with the right coefficient name.

Question: why not call the header "1PUR" ?.

Edit the TABLO Input file ORANIG.TAB to add the WRITE statement. Then run TABLO to process the new version of ORANIG.TAB (Don't forget to choose the STI file first, via **TABLO:Options**…**Run from STI…Select… ORANIG.STI**.) Finally run GEMSIM with the Command file FORMULAS.CMF to calculate the values and write them to the Summary file.

## Calculating New Coefficients

As you analyse simulation results, you will need to calculate other values derived from the data file. Often the best way of doing this will be to add extra COEFFICIENTs, FORMULAs and WRITEs to the bottom of ORANIG.TAB.

22. The share of labour (V1LAB_O) in primary factor cost (V1PRIM) has a close connection to the concept of shortrun supply elasticity. Explain. (Hint: Appendix J ORANI-G document)

Add statements to the end of ORANIG.TAB which:

(a) define a new coefficient LABSHR dimensioned over IND.
(b) give the formula for LABSHR
(c) write LABSHR to the summary file with header "SHLB".

Which industry has steepest shortrun supply curve?
And which the flattest?

## Basic, Margin and Tax Components for Main Users

An elaborate example of an addition calculating and writing out values calculated from the data file is in Excerpt 40 of ORANIG.TAB.

The excerpt constructs a four-dimensional matrix showing:

> for each good
> for each source (dom, imp)
> for each main user (Intermediate, Investment, Household, ... etc)
> basic, margin, and tax components of purchasers' values.

By manipulating this matrix within ViewHAR, a variety of information may be learned.

Use ViewHAR to examine the matrix MKUP in file SUMMARY.HAR. Use the matrix to answer the following questions -- you will need to make extensive use of ViewHAR's facilities for viewing shares and for slicing or summing.

23. Which commodity has the highest rate of tax ? (Use ViewHAR row shares feature). What share of total commodity tax revenue does that good account for? (Use ViewHAR col shares feature).

24. For which commodity does margins form the highest share of purchase cost?

25. What is the value at purchasers prices of household consumption of domestically-produced commodity Acucar?

26. Adding all commodities together, what fraction of purchasers' prices are commodity taxes? For domestic commodities only? For imported commodities only?

27. What % of government demands are imported?
    What commodity is the biggest part of government spending ? Explain.

28. What is the value at purchasers' prices of household consumption of imports of commodity OutProdAlim?